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San Luis Obispo Region Telecommuting Feasibility Study

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EXECUTIVE SUMMARY

Telecommunications are increasingly used worldwide as an appropriate technological solution to many problems associated with commuter traffic congestion and air pollution. Telecommuting generally refers to using modern communications technology to move information instead of using traditional forms of transportation (vehicles) to access information. Telecommuting provides a variety of benefits to business and society in addition to reducing traffic congestion and commute times.

San Luis Obispo County employers (public and private) could realize a combined savings of \$38,352,000 if employed County residents were telecommuting at the statewide average of 6%, providing the savings per telecommuting employee in San Luis Obispo County are equal to the low-end estimate for businesses elsewhere. If San Luis Obispo County employers realized just one quarter of estimated annual savings per telecommuting employee, the resulting \$9,588,000 annual cost savings would still be a significant factor.

Long-term economic viability of San Luis Obispo County is also tied to the development of telecommunications and telecommuting. Telecommunications has become the world's largest economic sector and is expected to account for 20% of the national economy by the year 2000. The federal government has responded to this technological revolution by actively promoting the development of a nationwide, interactive, multimedia information infrastructure that is accessible to all citizens. San Luis Obispo County can compete in regional, national and global marketplaces by developing a local infrastructure to provide first rate access to the National Information Infrastructure.

A viable telecommunications infrastructure depends on three elements: hardware development, software development and human development. Individuals must possess the necessary skills to fully utilize new technology if its development is to be meaningful to society as a whole.

In California, telecommunications and telecommuting have primarily been developed to serve major urban areas. The successful development of telecommunications and telecommuting in San Luis Obispo would likely serve as a model for rural development elsewhere. This report suggests steps San Luis Obispo County could take to provide a model of leadership for the technological transition of small-urban and rural areas into the 21st century.

For the purposes of this report, we have defined telecenter telecommuting and home-based telecommuting in the following ways:

A telecenter is a remote work center usually strategically located to reduce commute times for workers who use the center instead of a main office. A telecenter may be used by a single employer or multiple employers and individuals.

Home-based telecommuting is the use of modern communications technology to work from home instead of an office or a telecenter.

Based on the status of currently operating telecenters in the State of California and the potential market base for a telecenter in northern San Luis Obispo County, we suggest that the original telecenter concept be modified and expanded to encompass a Televillage™ or Smart Communities model. A vigorous education and advocacy plan should be undertaken prior to establishing an actual facility. The plan should provide for training to ensure participation, secure business, community and government support, and establish funding sources. An actual telecenter facility should serve as the focal point for the activities associated with the development of the Televillage or Smart Communities concepts. Televillages and Smart Communities are technological development concepts. They strive to facilitate the delivery of and access to governmental, educational, community and social services, and the facilitation of work and commerce. Those activities would include, but not be limited to, providing office space and telecommunications tools for telecommuters, hands on training and technical support, small business incubation, distance learning, access to government resources, and telemedicine. We recommend that telecommuting and telecommunications advancements in general be supported and developed in a cohesive fashion on a county-wide basis. It seems appropriate that the North County could serve as a launching site for the endeavor. To facilitate the recommendations, we suggest the following steps be taken:

- Create an Aggressive Education and Advocacy Program
- Establish a Regional Telecommuting Coordinating Agency
- Create and Adopt a Five-Year Plan For The Development and Implementation of Televillages or Smart Communities in San Luis Obispo County
- Pursue The Development of Telecommuting and Telecommunications in General From a Private Business (revenue-generating) Perspective
- Establish Pilot Programs Supporting Home-Based Telecommuting in Government and Business
- Pursue Public/Private partnerships to Develop Telecommunications Countywide
- Actively Support Pro-Telecommuting Legislation
- Advocate the Inclusion of Telecommuting Questions in Local, State and National Data Collection Efforts

Purpose

This report was commissioned by the California State Department of Transportation (Caltrans) to determine the feasibility of establishing a telecenter or telecenters in the northern portion of San Luis Obispo County. The original focus of the report was to determine the feasibility of establishing telecenters in the North County to help reduce congestion on the Cuesta Grade. The focus was expanded and now includes a broader analysis of the potential for

developing telecommuting in a variety of forms and telecommunications in general for San Luis Obispo County.

Transportation Issues

The communities in San Luis Obispo County are arranged in a wagon wheel fashion with the City of San Luis Obispo located at the center. Traffic flows in and out of the City from the surrounding communities at ever-increasing volumes because a significant number of county residents live outside the city but work, attend school, shop or conduct business in the City of San Luis Obispo.

Population

Population projections for the county based on a resource constrained scenario show a total population increase of 24,205 over the next five years and an increase of 97,816 by the year 2020. Last year, Atascadero and Paso Robles recorded two of the top three growth levels in the county while the population of the City of San Luis Obispo decreased. These figures suggest a continuing need to accommodate an increased demand for city resources and services while creating alternatives to the use of single occupant vehicles to access those services.

Employment

Current estimates show an average of 6% of the California workforce telecommuting in some way. Further estimates conclude that *15% percent of all jobs are suitable for telecommuting* (Mokhtarian 1995).

The workforce in San Luis Obispo County is currently estimated at 79,900 employees. The *UCSB Economic Forecast Project* has estimated 23.9% (19,100) of all workers in San Luis Obispo County are employed by the government (*Telegram Tribune* 08/15/95).

Trip Reduction

Research shows telecommuting two days per week (a typical frequency) can eliminate 4 trips per five-day week. The following table shows the trip reductions that could be generated in San Luis Obispo County by telecommuting at various rates.

Table 1: Estimated Trip Reductions Generated by Telecommuting in San Luis Obispo County

Segment of San Luis Obispo County Workforce Telecommuting Two Days Per Week	Number of Trips Eliminated Per Five-Day Week
6% of all workers (4,794 workers)	19,176
All workers with suitable jobs (11,985 workers)	47,940
6% of government workers (1,146 workers)	4,584
All government workers with suitable jobs (2,865 workers)	11,460

The above table is computed using the following estimates:

- 4 vehicle trips can be eliminated per five-day week in which an employee telecommutes two days.
- The current employment in San Luis Obispo County is 79,900 workers

Status of Known Telecenters in California

The study revealed one self-sustaining telecenter operating in the state at this time. Most of the centers have been open from one to three years. None of the telecenters studied are operating at full capacity, including those which are offering their services free of charge.

A majority of the site managers have expressed concern over future funding and have cited an inadequate advertising budget as a major problem. While building design, equipment and site location were carefully studied and well-planned at all of the sites studied, none of the sites conducted a substantial education or advertising campaign *prior* to establishing the site. Virtually all of the site managers we interviewed indicated they believe prior marketing and education efforts would have substantially improved the reception and hence, use, of the facility by business, government and the community.

Other problems frequently cited are an inability to get government to participate in telecommuting programs and resistance to telecommuting by middle management. Site managers are in general agreement that it is necessary to expand the services they offer to attract more clients. They also agree that strong education and advocacy programs coupled with successful pilot or demonstration programs are essential to bringing telecommuting into common practice.

The latest edition of the *Status Tracking Report for Telecommuting Centers in California*, produced by the Institute of Transportation Studies at the University of California at Davis (ITS), confirms our findings. The report states that "most [site managers] view the key to self-sufficiency as a combination of increased awareness/acceptance of telecommuting as a

concept and development of additional revenue generating services.” The California studies echo national studies when examining self-sufficiency.

John Ebeler, co-author of the Status Tracking Report, said another problem faced by telecenters was an initial lack of information sharing between telecenters. Even though each telecenter operates independently, they have many of the same needs (such as securing funding, marketing, researching new hardware etc.) that could be better met by working together. The status tracking reports, quarterly videoconferences between telecenters and a newsletter produced by ITS are helping to alleviate a certain amount time-consuming redundant tasks for centers receiving the information.

While the findings indicate telecenters in general are not fully utilized or self-sustaining at this time, they do show signs of improvement with the notable efforts underway to address current problems. The present telecenters are viewed as market research projects and the ultimate success or failure of these telecenters is yet to be determined. Either way, they serve as integral pieces of the Televillage or Smart Communities networks.

Market Base

Our research shows that a similar set of requirements would exist to attract customers to a telecenter in San Luis Obispo County as elsewhere in California. The rural character of the area would tend to amplify the need for diversity and marketing outreach. We can benefit by using the knowledge gained from the experiences of established telecenters to develop a different approach and increase the opportunities for success. Sufficient numbers of jobs suitable for telecommuting are held by workers in San Luis Obispo County. However, these jobs do not presently translate into a market base that would support a telecenter because both employees and employers demonstrate a need for education and training before they would be willing or able to institute telecommuting at meaningful volumes.

Business

A survey of 155 local San Luis Obispo businesses employing approximately 8,370 people indicates that while local businesses are technologically *poised* to take advantage of the substantial benefits of telecommuting, they are far from ready. In addition to the development of necessary infrastructure—knowledge, skills and “will” also need to be developed. The study shows business concerns such as cost savings and increased productivity far outweigh environmental concerns or even government regulation as a reason to consider telecommuting.

Successful demonstration and pilot programs can provide a model to encourage local businesses to move forward and fully use the technology they are in the process of acquiring. The following figures illustrate the current use of telecommunications technology by local business.

While 68 percent of the 155 businesses surveyed said they are familiar with the concept of telecommuting, only 19 percent of them have employees who telecommute at this time. Nineteen percent (30 businesses) may seem substantial, but keep in mind the figure includes

telecommuters of any kind, regardless of how limited in practice. While exact figures were not collected, verbal responses indicate the number of actual telecommuters is very small, with possibly as few as 30 out of the 8,370 employees telecommuting in some way, at some time.

In contrast, fully 97 percent of the businesses surveyed use computers. Results show an overall average of one computer for every two employees, yet only about 22 percent are connected to a local or wide area network and fewer than 35 percent of the total employees use e-mail.

Government

A survey of 13 county government departments and three state agencies employing 3,639 people said 24 employees telecommute on an occasional basis and two telecommute on a scheduled basis. Two respondents said they had an "unknown" number of occasional telecommuters. Only three of the 16 total respondents said they currently promote telecommuting within their department.

Seven respondents are willing to participate in a pilot telecommuting program and three need more information but are open to the idea. Of those ten respondents, only two said their department is adequately trained in data transfer processes using telecommunications tools. All of the respondents (except for one who gave no answer) said the County should encourage and support telecommuting. Most of the respondents indicated that they need more information, training and a better understanding of what telecommuting is and what it can do before they can make qualified statements regarding its application.

Community Involvement and Leadership

A coalition of local businesses, political leaders, schools and government agencies has come together to discuss the future of telecommuting in San Luis Obispo County. The coalition is evidence of the tremendous amount of momentum toward the development and advancement of telecommunication technology in San Luis Obispo County. It is also evident that a wide variety of needs be met in order to retain the support for this type of development.

It is clear that although the necessary elements may possibly evolve slowly on their own, without leadership and management they will not likely advance in a timely, substantial, or cohesive manner which will allow for interactivity or sustained support on a county-wide basis.

Conclusion

In short, it was found that the establishment of a telecenter is more productively viewed as a piece of a telecommunications / telecommuting network, rather than a starting point. This study concludes that the initial proposal to establish a telecenter in the North County be broadened to include the active implementation of the Televillage concept.

The Televillage concept provides a model for the development of a telecommuting network in rural areas. A Televillage is not necessarily a place, but rather an electronic network of human, business, educational, informational, government service, health-care and other

resources linked through telecommunications technology that can be used to build and extend development capacities of rural areas. It is this broad-based application of telecommunications that appears to be able to provide the foundation required for telecommuting as transportation to become effective and widely used. The Televillage model also encompasses numerous aspects which fulfill the policies and objectives outlined in the *California Transportation Plan* issued by the State of California.

Smart Communities, which closely parallel Televillages and are discussed in Appendix G, can also serve as a model of development.

Recommendations

This study indicates a well-planned, aggressive, **education and advocacy** program coupled with **pilot programs** supporting all forms of telecommuting is called for as a first step. Essential information can be obtained by **updating existing data collection efforts** (including the next census in 2000) regarding advanced technology use and distribution in households and businesses. Infrastructure and training programs should be developed via **public-private partnerships** throughout the county so that future needs of a variety of users can be met by a variety of providers acting cooperatively. Several projects from a variety of sources are underway at this time which may conceivably be incorporated into a county-wide plan. It is important to view the development of telecommuting and telecommunications in general from a **revenue-generating perspective** so that facilities are planned with a goal of self-sufficiency. Even so, public/private partnerships supported by government may well remain the most efficient initial launching mechanisms. Active involvement by local government and alliances in **supporting pro-telecommuting legislation** will help produce a political climate that facilitates development of telecommuting and related concepts.

A **five-year plan** that supports the development of the telecommunications network in the beginning and moves toward the development of telecenters *after* the need for them is established is recommended. See Appendix A for an overview of the recommendation.

To facilitate the five-year plan we recommend setting up a **regional telecommuting coordinating agency** contracted to local government. Further analysis is required to determine the best method of structuring the proposed agency. It may be feasible to establish the proposed agency under the auspices of an existing non-profit, for-profit, or public entity.

BACKGROUND

Introduction

Telecommunications is increasingly used worldwide as a modern technological solution to many of the problems associated with commuter traffic congestion, air pollution and information accessibility. Telecommuting generally refers to using modern communications technology to provide mobility and take the place of vehicle trips. Telecommunications and telecommuting benefit business, the economy and society by reducing traffic congestion, air pollution and commute times; providing access to global markets, information and resources; providing a foundation for new types and locations of commerce, and facilitating the development of livable communities.

Caltrans and SLOCOG have a particular interest in the application of telecommunications and telecommuting as a transportation demand management strategy. San Luis Obispo County faces a number of transportation challenges that can be met, in part, by the development and application of telecommunications technology.

The average *commuter* in San Luis Obispo County drives 26 miles round trip and the average *resident* drives about 30 miles each day. Most of those trips involve going to and from the City of San Luis Obispo. As the following information shows, significant number of county residents live outside the city but work, attend school, shop or conduct business in San Luis Obispo.

San Luis Obispo County Planning Department population projections (Jan. 1993), based on a resource constrained scenario, show a total population increase of 24,205 over the next five years and an increase of 97,816 by the year 2020. While the population of the County is growing, the City of San Luis Obispo showed a decrease in population from 1994 to 1995. As people move to the outlying communities, they continue to utilize services located in the City of San Luis Obispo.

San Luis Obispo County employment increased by 3.2 % between June 1994 and June 1995, which is more than two times the rate of population increase for the County for a similar period. The number of work-commuters is growing, as 51% of jobs countywide are located in the City of San Luis Obispo.

These figures suggest a substantial increase in the work force and greater demand for City resources. While mass transportation can accommodate a portion of the demand and associated problems, telecommunications will have a broader impact on the issues facing us in the next twenty years.

The successful development of telecommuting (in all of its applications) in San Luis Obispo can provide a model of leadership for the technological transition of rural areas into the 21st century.

The following distinctions will help clarify some terms used throughout this report:

Telecommunications implies a broad base of technology that reaches into every corner of our lives. The telephone, for example, is a telecommunications tool. For the purposes of this study, however, we will define telecommunications as the ability to import and receive text, graphics, audio, and video information to and from remote locations through equipment attached to a computer.

Telecommuting is the act of using the various telecommunications elements to import or export text, graphics, audio, and video information, for whatever purpose, in lieu of utilizing a motor vehicle to transport the information. Telecommuting has commonly been used for work purposes but has far greater applications for everyday activities.

Televillages™ and Smart Communities are electronic *networks* of services, ideas, resources and people, linked by telecommunications technology. Televillages are being pioneered in rural areas and Smart Communities are being pioneered in urban areas.

Telecenters are *physical structures* that operate as an important piece of the Televillage or Smart Community electronic network. Telecenters are usually remote work centers strategically located to reduce commute times for workers who use the center instead of a main office. A telecenter may be used by single employers, multiple employers, or individuals. A telecenter can also serve as a community resource center by providing access for the general public to the elements of the Televillage or Smart Community.

Home-based telecommuting is the use of modern communications technology to work, study and access services and information from home instead of using a vehicle to access a telecenter, office or service.

Infrastructure is the foundation of basic installations and facilities on which the continuance and growth of a community or economy depends. Telecommunications infrastructure includes the technology used to deliver information along the electronic highway and throughout a Televillage or Smart Community. The electronic highway is the electronic parallel to other infrastructure systems such as power, water, sewer, highway and rail systems. The electronic infrastructure is being developed on a variety of levels including public, private, cooperative and individual. The critical factor in development of any infrastructure is the ability to link the individual elements into a functioning network.

Purpose of This Report

The purpose of this report is to determine the feasibility of establishing a telecenter or telecenters in the northern portion San Luis Obispo County and to offer an analysis of the potential for developing telecommuting in a variety of forms, and telecommunications in general, for San Luis Obispo County. It has been developed in two parts as follows:

Part One: The North County Telecommuting Feasibility Study

The North County Telecommuting Feasibility Study represents the original study commissioned by Caltrans. The purpose of this part of the report is solely to determine the feasibility of establishing a telecenter or telecenters in the northern portion of San Luis Obispo County. This part of the report is presented in its entirety before moving on to the second, expanded part of the report.

Part Two: The Development of Telecommuting in San Luis Obispo County

This part of the report examines the potential for developing telecommuting and telecommunications in general for San Luis Obispo County.

Research Methodology

This section describes the research methods used to generate this report. It does not attempt to provide analysis or conclusions. For in depth discussion of the research, please read parts One and Two of this report.

Review of Literature

This study began with a review of literature published on a wide variety of topics surrounding telecommuting and telecommunications in general. Sources included reports, surveys, studies, manuals, handbooks, articles and marketing publications. The literature reviewed covered more than a decade of telecommuting and relevant topics. While the recent publications proved most useful, the older ones helped present the historical evolution of telecommuting in California. A bibliography can be found in section X of this report.

Most of the information gleaned from the literature review is presented in context throughout this report, however, there are several important works which should be mentioned now.

Telecommuting Centers and Related Concepts: A Review of Practice

One of the most comprehensive and recent studies used to prepare this report is *Telecommuting Centers and Related Concepts: A Review of Practice*, issued by the Institute of Transportation Studies at the University of California at Davis, written by Michael N. Bagley, Jill S. Mannering and Patricia L. Mokhtarian. The study was prepared for the Federal Highway Administration and Caltrans and presented March 1994.

The 150-page study covers telecenters and related concepts throughout the world and includes case studies of individual telecenters. This UC Davis study helped provide input for the "Residential Area Based Offices Program" which in turn has generated significant information about telecenters in California.

Status Tracking Report for Telecommuting Centers in California

The Institute of Transportation Studies also produces a periodic status tracking report which outlines the status of all known telecommuting centers (31) in California. Twelve of the

centers being tracked are involved in the “Residential Area Based Offices Program” which is sponsored by the Federal Highway Administration and Caltrans and is administered by the Institute of Transportation Studies. The status reports helped guide the development of this study as we received updated information about the progress of operating telecenters in California.

The groundwork laid by Caltrans and the Institute at Davis have provided an invaluable foundation for the study and development of telecommunications and telecommuting in the State of California.

Technology in the American Household

The Times Mirror Center for the Press and People polled 4000 American households regarding their use of technology. The results, *Technology in the American Household*, published May 1995, includes up-to-date statistics concerning the use of technology and frequency of telecommuting nationwide by a cross-section of Americans.

Los Angeles Telecommuting Project

This report, prepared by JALA International, Inc. (March 1993), documents a formal telecommuting test project involving nearly 500 employees of the city of Los Angeles. The report provided valuable quantifiable information regarding the implications of telecommuting for the City of Los Angeles. JALA International includes the expertise of pioneers in the telecommuting field such as Jack Nilles, who coined the term “telecommuting” in the 1970’s. JALA has designed models for quantifying the sometimes elusive factors such as “improved effectiveness” that produce results that can reasonably be applied to regions outside of Los Angeles. This report was particularly useful in estimating the financial benefits of telecommuting.

Rural Televillages

The Kentucky Science and Technology Council, Inc. initiated, and has fostered the concept of “Televillages” since 1991. This report provides an overview and conceptual guidance concerning the development of telecommuting and related facilities in non-urban areas.

Interviews

Personal interviews and group meetings were conducted with industry professionals, telecenter site managers and users, transportation experts, telecommunications purveyors and users, telecommuting planners, telecommuters, business owners, government agencies, educators and political leaders throughout San Luis Obispo County and the State.

The interviews provided firsthand information about the challenges and successes experienced by participants in the telecommunications and telecommuting fields, and input from potential future participants.

Surveys

Three non-scientific surveys were conducted in order to help determine both the success rate of telecenters currently operating in California. They also examined the potential for

successful operation of a telecenter in the North County. Information from previously completed and in-progress surveys (local, state and national) was also used. The survey results are discussed in context throughout the report and selected surveys are also provided as appendices.

Telecenters

The first survey performed consisted of a written questionnaire mailed to 23 telecenters throughout the State of California; the telecenters were also contacted by phone. Surveys were completed in a variety of ways. In all, seventeen telecenters completed the survey, a 73 percent response rate. The sampling was drawn largely from a list of telecenters participating in an ongoing study being conducted by the California State Department of Transportation (Caltrans). Survey responses provide a general profile of telecenters currently operating in California and parallel the information found in the April 1995 *Status Tracking Report for Telecommuting Centers in California*, provided in Appendix H. More importantly, the surveys involved a personal interview process that helped provide a candid perspective from the site managers.

Businesses

The second survey performed was a telephone survey of 155 businesses located in the City of San Luis Obispo employing approximately 8,370 people, approximately 1,203 of which live in the North County. Survey responses provided insight into the needs and attitudes of potential business users of a telecenter. The results of the local business survey can be found in Appendix B.

Government

A third survey of thirteen San Luis Obispo County government departments and three State agencies was conducted by telephone. Survey responses indicated the current level of telecommuting by county government and attitudes toward future development. The results of the government survey can be found in Appendix C.

Site Visitations

Three operating telecenters in California were visited to provide a firsthand look at various types of facilities serving various communities. All three are participants in the Caltrans study.

The Grass Valley telecenter is located near Nevada City in the central Sierra Nevada region and serves commuters to Sacramento. The Ventura Telecenter is located on the Ventura Community College campus in Ventura, serving local commuters as well as Santa Barbara and parts of Los Angeles. Landmark Executive Suites is a telebusiness center located in Anaheim serving commuters throughout the Southern California region.

Locally, visitations were made to several sites which are using or have the potential for developing telecommunications technology that may be suitable for integration into the development of telecommuting in the North County.

Identification of Telecommunications Projects in Development

Telecommunications projects that could impact development of telecommuting in northern San Luis Obispo County, and San Luis Obispo County as a whole, were identified and analyzed through participation in the Regional Network Consortium, the Emerging Technologies Committee of San Luis Obispo, the North County Telecommuting Coalition, the Nipomo Area Advisory Group and several others.

Publicity generated by the North County Telecommuting Feasibility Study helped create a flow of information that greatly facilitates the cohesive development of the wide variety of projects in progress and helped bring telecommuting to the forefront of discussions concerning regional telecommunications issues.

Identification of Funding Sources

A variety of funding sources to support a five-year development plan can be found in Appendix D. The sources include public and private agencies which have a history of funding or supporting telecommuting development. Funding sources to launch a program may stem from public/private agreements that move toward a self-sustaining, revenue-generating operation. Funding commitments will rely on the presentation of a proposal backed by a business plan which is recommended for development in the next phase of this project.

Telecommuting Today

Telecommuting developed as a concept in the mid seventies. However, it has experienced dramatic growth in the business community during the last ten years. This section provides a historical perspective of telecommuting in preparation for the sections that specifically address telecommuting in San Luis Obispo County.

The Developing Necessity of Telecommuting

As we move from the modern Industrial Age to the Information Age the social, cultural and economic paradigms that have guided us for the last 50 years are beginning to shift. These fundamental shifts are producing a technological revolution centered on the rapid movement of information, whether it be in the world of work or leisure. This reliance on the movement of information clearly points to telecommuting as a means to achieve accessibility and eliminate vehicle trips. Research shows that telecommuting is a viable means by which work can be accomplished. It also provides the following benefits:

- Reduces non-work trips on telecommuting days by about 32% (Transportation Research Group, pg. 54)
- Improves employee morale, increases employee productivity by about 20% and reduces absenteeism (JALA International, Inc.)
- Reported savings of \$8,000-\$12,000 annually per telecommuting employee for businesses (Perey 1994)

- Reduces energy use by about 13% per year per telecommuter (telecommuting 1 day / week), mostly from our most rapidly declining energy resource--fossil fuels (JALA International, Inc.).
- Saves money by allowing businesses to relocate away from prime real estate areas
- Eliminates work trips without increasing non-work trips. It reduces automobile related pollution, traffic congestion, and parking problems.
- Offers opportunities to help create more livable communities by allowing people to work and conduct business closer to home, and by creating greater time-management flexibility which positively impacts family responsibilities and reduces stress
- Improves access to information and educational resources for a larger segment of society
- Creates an environment that allows for economic competitiveness in a competitive global, information economy
- Provides opportunities for economic growth not necessarily accompanied by physical growth

The State of Telecommuting

According to Patricia Mokhtarian, a telecommuting expert at UC Davis, studies estimate that approximately 6% of the California workforce telecommute in some way, however 14%-16% of the workforce is employed in jobs *suitable* for telecommuting. According to Mokhtarian, the formula for estimating the total number of jobs suitable for telecommuting considered constraints such as type of job, technology, cost, management resistance and so on. However, she said the study further concluded that probably only half of those who hold jobs *suitable* for telecommuting would *want* to telecommute. Those figures underscore the importance of public education regarding the many benefits of telecommuting.

Commuter Transportation Services, the former rideshare agency for the counties of Los Angeles, Orange, San Bernardino, Riverside and Ventura performed an annual random population survey for those counties that estimates 10% of the workforce in those counties telecommute. A similar survey performed in the San Francisco Bay area showed the same results. Experts estimate that non-urban areas (such as San Luis Obispo County) probably experience 3-4% of the workforce as telecommuters and local businesses are beginning to provide technology that can support telecommuting in some fashion. A San Luis Obispo Ridesharing survey shows 11.3% of small to medium employers, and 19.6% of large employers currently offer a telecommute center and/or videoconferencing. A poll of 13 San Luis Obispo County Government departments revealed a .006% telecommute rate for those departments.

The US Chamber of Commerce Telecommunications Infrastructure Task Force performed the *National Information Infrastructure Survey* of 1,600 businesses across the country

and found that businesses appear willing to invest in information infrastructure components and applications as long as they help solve current business problems and improve efficiency. A survey of businesses located in the City of San Luis Obispo showed the same conclusion. One of the challenges to the emerging infrastructure will be to meet the clear cut demand for *uniformity of services* offered by a *variety of providers*.

Home-based businesses often involve the use of telecommunications technology but the self-employed are not always thought of as telecommuters. As telecommunications technology is integrated into business, self-employed individuals often evolve into full-fledged telecommuters without realizing it. Some home-based businesses are obvious candidates for telecommunications tools and are generally initiated by individuals with some knowledge and experience in working with those tools. These businesses include financial services, bookkeeping, computer related businesses, sales, etc. Businesses such as crafts, manufacturing, consulting and others are not so obvious. The cabinetmaker who buys a fax machine and computer and begins using the Information Superhighway to design and sell cabinets, research, advertise, and order supplies has expanded services, resources, market base, and is in fact telecommuting.

Many home-based businesses or employment situations that were unimaginable just five years ago, may now be attained with relatively little training and expense. The integration of telecommunications tools provides employment opportunities for primary caregivers, disabled individuals and other people whose time, resources or mobility is restricted in some way.

In 1994, the City of San Luis Obispo issued 164 home occupancy permits. Paso Robles has issued 63 permits to-date this year. Atascadero issues an average of 425 permits each year and the County of San Luis Obispo averages 300 to 400 permits each year. These numbers will likely increase along with education, training, affordability and simplicity of telecommunications tools.

The increasing role telecommunications technology plays in the lives of Americans is highlighted in a survey of 4,000 households by the Times Mirror Center for the People and Press. The May 1994 survey, *The Role of Technology in American Life*, reveals that nearly one in three households contains a personal computer and a majority of employed people (55%) use a computer at the workplace. The poll clearly shows that technology is facilitating the trend toward working at home, which ultimately may increase people's desire to telecommute. Note the following findings:

- The personal computer at home is used by 67% of the respondents for their jobs and 46% for school-related activities.
- 45% of all employed respondents said they worked at home "often" or "sometimes," or had a home-based business.
- 27% of all respondents said they worked at home at least part of one day in the past week, including 7% who stayed home entirely that day.

The Times Mirror survey states, "the ability to go on-line via modem from home is having a dramatic effect upon the ability, and perhaps the propensity, to work at home." An impressive 60% of frequent on-line users worked at home one day or more during the week before the survey interview. Compare that to 42% of PC users without on-line capability and 20% of respondents without computers. Nearly half of the modem users interviewed said they often or occasionally connect with computers at work or school.

The Future of Telecommuting

The upcoming generations will provide a wave of skilled users that dramatically accelerates the pace of telecommunications technology integration.

Business is leading the way in adopting new technology as education creates a greater understanding of how the various technological elements can be used and shows the "bottom line" benefits generated.. The following tables represent expected high annual growth rates in the use of the certain components and applications by business over the next five years

**Table 2: National Information Infrastructure
High Growth Components During the Next Five Years**

Component	Percent Using Today	Percent Using In Five Years	Percent of Average Annual Growth Rate
Mobile Satellite Services	5%	23%	36%
Telework Centers	10%	33%	27%
Fixed Satellite Services	8%	24%	25%
Off-premise Teleconferencing	27%	55%	15%
On-line Services	39%	74%	14%

Table taken from the 1995 National Information Infrastructure Survey, pg. 11

**Table 3: National Information Infrastructure High Growth Applications
During the Next Five Years**

Application	Percent Using Today	Percent Using In Five Years	Percent of Average Annual Growth Rate
Electronic Marketing of New Products	10%	44%	34%
Videoconferencing	15%	57%	31%
CD-ROM access for journals, publications etc.	28%	77%	22%

Employee education and training via two-way audio, videotapes, and/or interactive television	32%	75%	19%
Electronic mail	39%	81%	16%

Table taken from the 1995 National Information Infrastructure Survey, pg. 14

Overwhelmingly, business cited a *perceived* lack of need for an application or component as the main reason they do not use, or plan to use, a given element. Other reasons given included high cost, lack of availability, or a lack of expertise in the organization. The U.S. Chamber of Commerce believes education and training will remove many of the barriers to adopting new technology.

The future of telecommunications development and telecommuting will be affected by legislative changes that are under consideration at a number of levels. The California Public Utilities Commission (CPUC) has responded to Senate Bill No. 1939 by initiating an investigation into the establishment of special telecommunications programs to encourage telecommuting throughout the state. Assembly Bill 3643 directed the CPUC to investigate access issues.

On the federal level, two companion bills encompassing broad telecommunications reform are in the process of being reconciled. The Senate has produced S652, the *Telecommunications Competition and Deregulation Act of 1995*, and the House of Representatives has put forth HR1555, the *Communications Act of 1995*. Other legislation contains provisions affecting funding of telecommunications development. Numerous federal and state department rules are being amended to address telecommunications and telecommuting on diverse levels.

The National Information Infrastructure Advisory Council and the Department of Education are both issuing reports on telecommunications and education. The proposed Republican budget calls for eventual elimination of the Commerce Department, the cabinet which is responsible for monitoring federal information technologies and telecommunications programs. Legislation, rulemaking, grants, advocacy and research are proceeding at breakneck speed and will all determine the course of development of telecommunications.

With supportive legislation, skilled users, less expensive and more reliable technology, and a more universal high-bandwidth infrastructure, telecommuting will realize its full potential. It will provide the opportunity for people to remain closer to home by providing access to work and services that now require an automobile. Imagine, taking interactive college credit classes in your home, buying your groceries while sitting in your living room and having them delivered, planning your vacation, visually conferring with your doctor about your child's flu-like symptoms, all through your television. This is what is coming and telecommunications, in all of its forms, will deliver this.

As society continues to move toward the new social, cultural, and economic paradigms created by this technological revolution, telecommuting will become integrated into our daily lives on every level. Most children in the United States use computers of some sort at school and play. They observe computers as everyday tools. While an adult may think a grocery clerk rings up a sale and makes change from a cash register, the child sees it for what it is, a highly technological networked computer. As these children move into adulthood, they will expect the tools they have been trained on to remain available. It is important that facilities be created allowing access to technology for all members of society.

PART 1: The North County Telecommuting Feasibility Study

This part of the report attempts to determine how many people would use a telecenter located in northern San Luis Obispo County; how a telecenter would affect transportation and related issues; the types of services a telecenter could provide, and possible site locations. Unless otherwise stated, estimates of potential telecommuters assume the following (based on information from the University of California at Davis Institute of Transportation Studies):

6% of the workforce in California currently telecommute

15% of jobs are suitable for telecommuting

This section begins with an overview of the status of known telecenters in California and home-based telecommuting.

The Status of Telecenters in the State of California

There are 31 known telecenters in California and another seven are planned or in development. The telecenters are administered by various governmental agencies, such as a city or county government, regional Transportation Management Agencies, or private business interests. They are located in residential, commercial and industrial areas and range in size from four workstations to more than 30 workstations. With one exception, the Antelope Valley Telebusiness Center, all of the telecenters rely on government and corporate sponsors for financial backing. The Antelope Valley facility is actually comprised of two sites in close proximity to each other. It is one of the largest facilities and enjoys the benefits of having a large corporation committed to telecommuting as a paying client. Some of the other telecenters are charging a fee to users and some provide the services for free, but are still not operating at capacity.

Telecommuting Centers and Related Concepts: A Review of Practice provides a global profile of costs associated with establishing a telecenter. Start-up budgets for multiple-employer telecenters utilizing a facility separate from one of the employers existing facilities ranged from \$120,000 to \$425,000. Most commonly, 30-40% of seed money would be supplied by one government agency, with matching funds coming from other public agencies and the private sector. Private-sector companies also donated furniture, office equipment and start-up cash. Typically, businesses pay about \$100 per month to rent a space in a telecenter although the range is from zero to \$850.00 per month. Operating expenses ranged from about \$6,600/month to \$18,900/month with the largest facilities having the lowest cost per workstation. Different accounting methods are cited as the most likely reason for the wide range of cost figures. The disinclination on the part of employers to pay rents approaching market value, or any rent at all, is a major barrier to telecenter utilization (Bagley, *et al.*, 1994).

According to *Review of Practice*, the time taken to establish a functioning center ranged from six weeks to three years worldwide, with the mean for US telecenters being a little less than six months. In retrospect, the respondents for that study said they believed spending less time on developing the facility and more time on marketing would lead to higher center utilization and improved center success. Respondents also generally believed an additional 12 to 16 months was needed to develop that particular center.

Most of the site managers interviewed for this study voiced similar sentiments. They also believe increased awareness and acceptance of telecommuting as a concept by potential clients, and the development of additional revenue generating services are essential elements to reaching self-sufficiency. They are making efforts to increase advertising, networking and visibility to both the corporate world and the general public. Strategies for diversification include videoconferencing, distance learning, training facilities, support for home-based telecommuting and drop-in use of office equipment.

Telecenters have been successful on several levels (they were heavily used following the 1994 Northridge earthquake), but have not yet reached their full potential. They will likely come into their own with increased marketing, diversity and education efforts and are an integral part of any electronic network.

Six Reasons Why Telecenters Are Underutilized and Not Self-Sustaining

This study identified six major obstacles to the development of known telecenters.

General Misunderstanding of the Concept and Benefits of Telecommuting

When an office manager for a local food services company was asked to participate in a telecommuting survey, she and her superior both claimed that telecommuting “did not apply” to their business. After receiving more information about telecommuting opportunities, she decided that at least three of the company’s 35 employees could indeed telecommute. This story is not uncommon. People need to be educated as to what telecommuting is, what it can do, and how they might participate. The current vision held by the general populace is that telecommuting is a high-tech, expensive, complicated process that is mainly used by corporate executives and bears no relevance to the average person’s life or job.

Inadequate Marketing

All of the telecenters studied would have benefited from advance public relations campaigns, specifically targeting, soliciting, and educating potential clients, particularly corporate and government clients. These types of organizations often require extended personal contact prior to committing to formal telecommuting programs which can, ultimately, establish a long-term, revenue stream for telecenters.

Most of the telecenters studied are relying on the marketing expertise and available time of the site manager who may or may not have any marketing experience. Current marketing efforts are increasing but are hampered by severely restricted budgets. In addition to budget

constraints in general, restrictions attached to public and some private grants frequently prohibit or severely limit the use of those funds for marketing. Government funding models frequently attach moneys to physical structures, thereby precluding aspects of development (such as education and training programs) that now appear crucial for successful telecenters.

Over Reliance On Subsidies

Although a combination of public/private and corporate grants will likely remain a valuable and practical funding base from which to construct and launch telecenters, continued reliance on subsidies has significant drawbacks.

Time spent soliciting grants due to a lack of self-sustaining revenue often precludes sustained, vigorous, marketing efforts, resulting in a lack of growth for the telecenter causing further need for subsidies. The funding sources need to be pursued simultaneously to break the cycle so reliance on subsidies can be eliminated as quickly as possible. The economic benefits accrued to organizations participating in telecommuting must be, in part, returned to the mechanism making it possible. A program that relies entirely on the goodwill of taxpayers will likely not survive today's economic realities and cannot be considered successful. Furthermore, the entrepreneurial spirit which drives all innovative programs into the mainstream is critically dampened by the task of having to always seek more money through grants or other subsidy programs, as opposed to finding the needed money through the generation of earned income.

Management Resistance to Change

Middle management resists telecommuting because of the misconception that telecommuting diminishes the role of middle management. In spite of the fact that telecommuters require supervision similar to on-site workers and usually increase productivity over non-telecommuting days, remote management continues to be viewed as problematic. Results oriented, rather than process oriented, management styles associated with telecommuting have been shown to increase employee productivity by 20-50% (*Perey 1994*).

Employers aren't taking advantage of telecommuting opportunities at all staff levels. *The Telecommuting Survey of Orange County Employers* found that over half of employers said executive managers were eligible for telecommuting, while less than a third reported clerical workers eligible. Traditional management hierarchies assign more freedom and flexibility to higher levels and more supervision to lower staff levels. Studies show that the typical telecommuter in a corporation is a male executive while clerical workers and others involved in records-keeping and information transfer can easily perform most tasks off-site. Many employers do not view telecommuting as a substitute for on-site work, but consider it a supplemental activity. Experts estimate 15% of all jobs are suitable for telecommuting (*Telecommuting Advisory Council-O.C. Chapter*).

Narrow Scope of Offerings

A number of telecenters stymied in their development lamented that they need to offer more than just office space and computers. Clients and potential clients are requesting video conferencing, remote access to educational courses, hands on training, and multi-media

equipment. Nearly all of the telecenters are in the process of broadening the base of services and programs offered.

Government Agencies are Not Using Telecenters

Government workers comprise significant percentages of local work forces throughout California. Given that many jobs in government are suitable for telecommuting, and that government should be taking a leading role in the development of telecommuting, it would seem that a high percentage of government workers would be telecommuters. In our investigation, this did not seem to be the case. Many government workers, with proper training and guidance could produce much of their work in a telecenter or at home.

Home-Based Telecommuting

A variety of telecommuting experts advocate the advantages of telecenters over home-based telecommuting. But some studies show home-based telecommuting is preferred by business by as much as 97% (Telecommuting Advisory Council-O.C. Chapter). Cost savings, increased productivity and improved employee morale produce an improved "bottom line" for companies that use telecommuting earnestly and efficiently.

Home-based telecommuting sets the stage for the development of telecenters which have not yet caught up in popularity. Home-based telecommuting has been more readily used for several reasons. Individuals who have the skills, tools and desire to telecommute often take the initiative in establishing a telecommuting agreement with an employer. This relieves the employer of responsibilities and expenses associated with assigning workers to a remote location such as a telecenter. Furthermore, telecenters are not available in large numbers.

The City of Los Angeles Telecommuting Project reports that telecommuting-specific personal investments made by project participants ranged from \$10 to almost \$8500 with an average of \$668. One advantage of home-based telecommuting is that employers and employees have the option of deciding what equipment is necessary and who will provide it. In many cases, the employee may already own a computer, modem, fax etc. or may decide that those tools are not essential.

Home-based telecommuting is also increasing in popularity because it affords communities and businesses an opportunity to move toward a more satisfying and efficient way of living on a daily basis. Specifically, businesses are adapting to it because it provides employees and employers the flexibility needed in today's rapidly changing world.

The development of global telecommunications infrastructure creates a competitive environment for the design and production of affordable telecommunications tools. While caution should be exercised against over capitalizing in technology that may be inefficient or obsolete in a short time, high quality, accessible, tools for developing telecommuting are available today. These conditions have produced telecommunications tools that also allow for more sophisticated home-based telecommuting, which could include video and telephone conferencing, simultaneous document sharing and transfer, and voice over data transfer.

Market Base for a Telecenter in the North County

The 1990 census of population and housing showed 53% of North County workers (11,070 workers) working outside of their city of residence which translates into 1,660.5 jobs *suitable* for telecommuting held by commuters. The population and number of workers has grown considerably since 1990. Current surveys show that 57.5% of trips from the North County to the City of San Luis Obispo are work-related. Not all jobs or workers are suited to telecommuting and not all of the commutes are made to the City of San Luis Obispo, nonetheless, a substantial *potential* market base might be assumed from those figures.

Business

Surveys of local businesses and county government indicate that although the *potential* market is substantial, there is no existing market to support a telecenter. While 68% of the 155 businesses surveyed said they are familiar with the concept of telecommuting, only 19% of them have employees who telecommute at this time. Nineteen percent (29 businesses) may seem substantial, but keep in mind the figure includes telecommuters of any kind, regardless of how limited in practice. While exact figures were not collected, verbal responses indicate the number of actual telecommuters is very small, with possibly as few as 29 out of the 8,370 employees of the businesses surveyed telecommuting in some way, at some time.

In contrast, fully 97% of the businesses surveyed use computers. Results show an overall average of one computer for every two employees, yet only about 22% are connected to a local or wide area network and fewer than 35% of the total employees use electronic mail. Local telecommunications providers report an underutilization of non-computer based telecommunications tools such as advanced telephone networks, voice mail and call forwarding.

While the foundation for telecommunications business applications is in place to some degree, the tools are not being utilized to their fullest potential because the benefits of those applications are not understood.

Survey results show San Luis Obispo businesses are ready to utilize certain telecommunications resources but are not ready to commit capital towards providing those resources. Educating businesses about the cost effectiveness of investing in telecommuting is essential.

Compare the answers given in table 4 by local businesses when asked if they would or would not be willing to *provide* a video conferencing service with the answers given when asked if they would or would not *use* an available videoconferencing facility if it offset other expenses.

Table 4: Comparison of businesses not willing to *provide* vs. *use* videoconferencing

	Sm/med businesses	large businesses
Would not be willing to <i>provide</i> telecommute center/video conferencing ¹	82.8%	75%
Would not <i>use</i> an available videoconferencing facility if it offset other expenses ²	40%	23%

¹ San Luis Obispo Rideshare Survey

² North County Telecommuting Feasibility Study Business Survey

A further division of the size of businesses reveals that small businesses are significantly less likely to use videoconferencing than medium businesses. Interestingly, numerous respondents who said they would use a videoconference facility also said they believe modern telecommunications tools are irrelevant to their business. The contradiction highlights the fact that people are generally confused by new technology, its applications and usefulness—they apparently did not associate videoconferencing with telecommunications technology.

Businesses responded that cost savings and increased productivity would be the most likely factors to motivate them to institute telecommuting programs. The least likely factors are environmental concerns or government regulations. Improved employee morale fell in the middle.

The results of the local business survey closely parallel results of the *National Information Infrastructure Survey* which included business of all types, located in a wide cross-section of American towns, cities and rural areas. The same conclusion can be drawn for San Luis Obispo as for the rest of the country; the significant forward momentum in the area of emerging technologies is accompanied by a need for education on how the tools can be used to benefit business.

Government

A survey of 13 San Luis Obispo County government departments and three state agencies employing 3,639 people said 24 employees telecommute on an occasional basis and two telecommute on a scheduled basis. Two respondents said they had an “unknown” number of occasional telecommuters. Seven of the 16 respondents are willing to participate in a pilot telecommuting program and three need more information but are open to the idea. Of those ten respondents, only two said their department is adequately trained in data transfer processes using telecommunications tools. All of the respondents (except for one who gave no answer) said the County should encourage and support telecommuting (see Appendix C).

The County of San Luis Obispo Information Services Division offers approximately 40-48 computer training courses to County employees each year. Each course serves 9 students and

about half of the courses are introductory. That means approximately 180-216 County employees are being trained in a new computer application or process each year. The same need for education exists prior to telecommuting. Most of the survey respondents indicated they need more information, training and a better understanding of what telecommuting is and what it can enable them to do before they can make qualified statements regarding its application.

Costs and Benefits of Telecommuting

Industry pioneer and telecommuting expert David Fleming states the average cost for a business to set up a telecommuter is less than \$1,000 and can easily be recaptured in the first year. Long term studies conducted by private companies, the California Energy Commission and the City of Los Angeles place the average financial benefit of having an employee telecommute between \$8,000 and 12,000 annually. The range for start-up costs is zero to \$4,000 or \$5,000 depending on the job requirements of the telecommuter (*Perey 1994*).

Productivity increases typically range from 21% to 38% and have been reported up to 100%. In addition to productivity, overall effectiveness (of which productivity is a component) is increased as well. Estimated increased effectiveness could translate to a positive annual dollar impact of \$75,794,175 (constant 1992 dollars) for the City of Los Angeles (JALA International, Inc. pp. 22-27, 52)

The JALA report further states that some public and private organizations may experience an effectiveness increase double that of the City of Los Angeles. Conservative estimates show a 2.3 billion to 3.5 billion dollar annual benefit from telecommuting to the Los Angeles region. When macroeconomics are taken into consideration, the increase in effectiveness and hence, competitiveness, act to increase economic growth in the region in general. The authors believe the actual impacts could be as much as five times the conservative estimate.

“That is, in the year 2000, telecommuting could be associated with a 10 billion dollar improvement in the [Los Angeles] region’s economy, compared to what it might be with no telecommuting” (*Ibid.* pg. 52-53).

The studies generally reflect savings experienced by large organizations operating in an urban environment and may not necessarily be true for businesses in San Luis Obispo County for a variety of reasons. If we look at government as a large “business” we can apply the formula for ascertaining potential savings. It is important to note that cost factors create variables which would affect the final figure. Improvements in employee productivity are responsible for a large portion of the estimated savings but other factors such as reduced costs for real estate, parking spaces, decreased sick leave, lower medical costs, decreased turnover and increased ability to attract staff also play a part. In order to produce cost savings estimates for San Luis Obispo County it is necessary to implement telecommuting pilot projects in a cross section of organizations in this county and track them meticulously for a minimum of two years.

Based on the industry standards available, the following estimates make a compelling case for implementing telecommuting in San Luis Obispo County.

Business and Government Combined

By applying the low-end estimated annual cost savings per telecommuter (\$8,000) to the jobs suitable for telecommuting held by workers living in the North County (1,660.5), we arrive at an estimated combined savings of \$13,284,000 annually for employers of those workers if telecommuting were implemented. If employed North County residents were telecommuting at the statewide average of 6%, the annual benefit to their employers would be \$5,313,600. If the actual savings experienced in San Luis Obispo County were reduced to one quarter of the low-end industry standard, the estimated annual savings would still be an impressive \$1,328,400 with 6% of North County residents telecommuting.

Government Only

There are 20,762 workers in North County (1990 census). Countywide, 23.9% of all workers are employed by the government. If we apply the countywide average to the number of workers in the North County, we find a total of 4962 government workers living in the North County. Assuming 15% of those jobs are suitable for telecommuting, we find 744 government jobs suitable for telecommuting held by North County residents. An \$8,000 annual savings per employee translates into a \$5,952,000 cost benefit to government by implementing telecommuting for North County residents. The statewide average rate of telecommuting would produce annual savings of \$2,381,760. By reducing the estimate to one quarter of the low-end industry standard, government (all levels combined) would save \$595,440 if 6% of North County residents were telecommuting.

The above estimates are conservative and do not take into account the macroeconomic benefits that traditionally result from the increased competitiveness associated with an improved bottom line.

Transportation Issues for Commuter Traffic Between the North County and the City of San Luis Obispo

The Cuesta Grade, a four-lane section of State Highway 101, is used by all traffic traveling 101 between the City of San Luis Obispo and the North County. The average annual daily traffic on the Cuesta Grade was estimated at 40,000 vehicles per day in 1994. The route is heavily impacted during commuter hours and is further congested by overly large vehicles which have difficulty climbing and descending the steep grade.

Reducing emissions (by reducing trips) that contribute to regional air quality standard violations is mandated by the state and a benefit of telecommuting. The necessary data is not available to determine precisely how many trips could be eliminated by the development of

telecommuting in the North County. However, the following information provides a backdrop against which some estimates can be made.

The first two estimates deal strictly with the mileage reduced directly from eliminating work trips by home-based telecommuting. The third and fourth estimates also take into consideration the decrease in *non-work* trips that are associated with telecommuting.

Analysis #1

According to 1990 census figures, 53% (11,070) of workers in the North County work outside of their place of residence. *San Luis Obispo Rideshare Agency* reports an average commute distance (countywide) of 13 miles one way or 26 miles round trip.

Table 5: Vehicle miles eliminated by various rates of telecommuting in the North County.

Type and Volume of Telecommuting	Vehicle miles eliminated each workday
Home-based at current statewide average (6%)	17,264
Home-based/ all suitable jobs (15%)	43,173

Current North County employment statistics are not available, but we know employment growth rates countywide have exceeded population growth rates countywide for the last decade. If we assume a similar set of conditions for the North County we can see that employment has likely increased substantially. The population of Paso Robles grew by 11% from 1990 to 1993, and 3-4% annually between 1993 and 1995. Other North County communities have been growing at about 3-4% annually from 1990 to the present.

The average one-way commute to the City of San Luis Obispo from the North County is about 19 minutes, which can be reasonably estimated to be about 23 miles, 10 miles further than the estimate used above. Preliminary findings of the 1994 *Origin Destination Survey* performed by Korve Engineering for SLOCOG show 64% of trips originating from homes in the North County are destined for the City of San Luis Obispo.

The above factors could substantially increase the mileage reduction estimates in analysis #1.

Analysis #2

A smaller, more precise analysis can be made of 857 County Government workers who live in the North County.

128 of those jobs are suitable for telecommuting and 83% of those workers drive alone to work, according to rideshare reports which are more recent than available census data. The result is 212 one-way, single-occupancy, work-related vehicle trips which could be eliminated by a fully implemented, home-based, telecommuting program. When we use the current statewide average, the result is 85 one-way trips. The following table assumes a 23-mile average one-way commute.

Table 6: Vehicle miles eliminated by telecommuting County Government workers based in the North County

Type and Volume of Telecommuting	Vehicle miles eliminated per telecommute day
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Home-based/ all suitable jobs	4,876
Home-based at current statewide average	1,955

Analysis #3

An analysis that applies to telecommuting in general, not just home-based, can be made using the following studies.

A 1981 federal study involving 7,000 federal employees of 35 agencies working four 10-hour days instead of five 8-hour days shows the compressed work week resulted in a reduction of total weekly household vehicle miles traveled (VMT) (and related emissions and fuel consumption) of approximately 16% among all employees in participating agencies.

A smaller, more recent study of the compressed work schedule of the Los Angeles County Public Works Agency shows average weekly trips reduced 9.1% and weekly VMT reduced 17.1% . If we equate a compressed work week to a work week in which one day is spent telecommuting these figures can reasonably be applied because the VMT reductions can be traced to increased flexibility which is also experienced by telecommuters. Other studies show that telecommuters (and their family members) tend to reduce overall vehicle use.

The average county resident (not to be confused with *commuter*) drives about 30 miles on a typical day, or 210 miles each week. A 16% reduction would yield 176.4 VMT/week for the average county resident. If we apply this figure to potential telecommuters in the North County (based on 1990 employment figures) we can make the following estimate:

San Luis Obispo County would experience a reduction of 55,792.8 miles of weekly VMT with telecommuting implemented in the commuter segment of the North County work force alone.

It is reasonable to expect the actual reduction to be greater. In addition to providing the flexibility associated with a compressed work week and resulting in reduced travel, full-time telecommuting completely eliminates most work-related trips. While it is most common today for people to telecommute one or two days each week, frequency will likely increase as telecommuting becomes more common. Current employment statistics would also substantially increase the results. The inclusion of non-work-related VMT reduction (potentially associated with telecommuting) increases overall reductions by about 30% over analysis #1.

Analysis #4

The following table illustrates a fourth analysis based on the *Telecommuting and Travel Demand* estimate of 4 vehicle trips eliminated per five-day week during which an employee telecommutes two days.

Table 7: Vehicle trips eliminated by various rates of telecommuting in the North County.

Segment of North County Workforce Telecommuting	Number of Vehicle Trips Eliminated per Five-day Week
all suitable jobs	6,642
current statewide average	2,656.8

Table uses 1990 census employment estimates

Air Pollution

Telecommuting reduces air pollution as a direct result of reduced automobile use. The two phases of automobile-produced air pollution commonly looked at are the cold start phase, which produces significantly more pollutants than the second, hot running phase. Seventy percent of emissions of a 30 mile trip are emitted in the first five minutes after a cold start.

The use of a telecenter decreases the time spent in the hot running phase but still necessitates the cold start, unless the telecenter is accessed by alternative forms of transportation. Home-based telecommuting eliminates both the cold start and the hot running phases associated with commuting.

The 1987 clean air plan for the San Luis Obispo Air Pollution Control District (APCD) called for a 40% reduction in overall emissions inventory. The district estimates about 30% has been achieved and the strategy for eliminating the remaining 10% will be outlined in the revised clean air plan due out December 1995. The 1987 plan cited on-road vehicles as the source of 39%-40% of ozone precursors (ROG and NO_x) emitted daily countywide. Ozone precursors work together with other elements to form harmful ozone which is believed to contribute to global warming.

The reduction in single-occupancy, work-related vehicle trips (based on analysis #2, Part One, section IV) for all *suitable* jobs held by County Government workers who live in the North County would eliminate the following amounts of emissions. The amounts are calculated according to the 1995 emission standards based on EMFAC7F1.1 issued by the California State Air Resources Board.

Table 8: Emissions reduction estimates for telecommuting County Government workers based in the North County (213 one-way trips/day)

Reactive Organic Gasses (ROG) ¹	601 lbs/yr
Oxides of Nitrogen (NO _x)	295 lbs/yr
Particulate Matter smaller than 10 micrograms (PM ₁₀)	6,424 lbs/yr

¹The figures for ROG and NO_x combine to eliminate 896 pounds of *ozone precursors* annually.

Telecommuting will be a proposed transportation control measure in the revised clean air plan for the San Luis Obispo district. Telecommuting has emerged as an increasingly important alternative since a variety of other vehicle-related emissions-reduction programs have been scaled back or eliminated. Some of the programs, such as the Employer Trip Reduction Program (rule 901), were scaled back by the State Legislature. Economic hardship for businesses was often cited as the reason.

Telecommuting provides opportunities to improve air quality and economically benefit business. The implementation of telecommuting will directly help the APCD meet the following requirements of the California Clean Air Act:

- “Implement reasonably available transportation control measures and assure a ‘substantial reduction’ in the growth rate of motor vehicle trips and miles traveled”
- “Sufficient control strategies overall to achieve at least a 5% per year reduction (40% overall) in ROG and NO_x emissions countywide, using the 1987 emissions as the baseline level”

Traffic Congestion

The 1990 census shows 57% of all workers who live in the North County work outside of their community of residence. Three-fourths of all workers commute under 30 minutes each day and most all workers and students travel during peak hours. Telecommuting eliminates congestion by eliminating work-related commute trips or re-distributing them to off-peak hours. The redistribution of traffic flow is an important and flexible benefit of telecommuting. A worker who does not have enough suitable work to telecommute an entire day, may often have an hour or two of paper or phone work that could be managed through telecommuting thereby allowing for travel during less congested times of day.

Telecommuting also substantially reduces non work-related trips by substituting on-line services for vehicle-accessed services and by a ‘runoff’ effect that tends to reduce vehicular dependence in general.

Urban Parking

Parking continues to be at a premium in downtown San Luis Obispo. The UCSB Economic Forecast estimates 51% of all jobs in San Luis Obispo County are located in the City of San Luis Obispo. Telecommuting from a telecenter would shift the burden of providing parking to less prime real estate. Home-based telecommuting eliminates the need for work-related parking altogether.

Expanding Population Base

The population of San Luis Obispo County grew 1.5% between the years 1994 and 1995. The Department of Finance projects that San Luis Obispo County’s population will reach 306,781 by the year 2010 and nearly double in the next 45 years, reaching 435,533 by the year 2040.

Much of the growth is taking place outside the City of San Luis Obispo, accompanied by a corresponding increase in commuter traffic destined for the city. Between 1994 and 1995, the total number of workers in the county increased 3.2% while the population only increased 1.5%. These figures indicate a greater increase in work-related commuter traffic than non work-related commuter traffic.

Bedroom Communities for San Luis Obispo

Low-availability of affordable housing in the City of San Luis Obispo is a contributing factor to the growth of outlying areas. Communities in the North County often serve as 'bedroom communities' for the City of San Luis Obispo in the sense that a significant number of employed North County residents commute to the City of San Luis Obispo to work. More than half of North County residents work outside their community of residence and nearly two-thirds of all traffic coming from the North County on highway 101 is destined for the City of San Luis Obispo. Similar situations exist for most other areas of the County.

The City of Paso Robles showed the second greatest population gain of cities in the county between the years 1994 and 1995 with growth of 3.3%. Atascadero followed with a 3.1% gain. At the same time, the City of San Luis Obispo is losing population.

Table 9: Population growth in San Luis Obispo County Communities between Jan. 1994 and Jan. 1995

Region	Current	Last Year	Difference
San Luis Obispo County	236,038	232,445	+1.5%
San Luis Obispo (city)	42,945	43,919	-2.2
Pismo Beach	8,294	8,017	+3.5
Paso Robles,	21,744	21,050	+3.3
Atascadero	25,225	24,465	+3.1
Arroyo Grande	15,495	15,223	+1.8
Morro Bay	9,900	10,071	-1.7
Grover Beach	12,440	12,527	-0.7

Data provided by the UCSB Forecast Project, Telegram Tribune, Aug. 15, 1995

Access to Information

People drive to the City of San Luis Obispo for a number of reasons besides work. Many of the resources utilized in the City of San Luis Obispo are informational resources which could be accessed through telecommunications. No studies have been done to enable us to precisely quantify the number of non-work-related trip reductions that could be realized by the implementation of telecommuting. However, the Times Mirror poll had this to say:

“The pattern of using technology to better manage their lives rather than increasing their entertainment options is pronounced among regular users of home computers and users who go on-line from home PC’s.”

The technology exists to provide access from telecenters or from home, but will only realize its full potential with large-scale, long-term, commitment and development efforts by society as a whole. Whereas the commercial sector is market driven, the public sector will be experiencing the benefits not as increased profit, but as reduced costs, providing more and better services, and creating better working and living environments. The following sections discuss some of the types of services that could be accessed on-line.

Business

Online business services are rapidly becoming indispensable tools for doing business in today’s world. E-mail, high speed data transfer, voice over data transfer, document sharing, digital data storage, video conferencing, and access to timely information are key services that could be offered in a comprehensive facility, or accessed right in the home.

The World Wide Web (WWW or “the web”) provides an excellent example of a market driven electronic industry that is dramatically influencing the way people do business. The web can be thought of as a directory of the world. Anyone can have a “page” in this directory. A page may include text, graphics, video or sound; it may be interactive and provide the opportunity to link to other web pages and information. The web increases access to customers, information and services for businesses, and increases access to products and services for the general public. This electronic service and others available can contribute to the development of telecommuting in all of its forms.

Education

The virtual university is here in the form of remote distance learning. Universities, colleges, training and vocational schools can now be accessed online. San Luis Obispo County as a whole can tap into professional training institutions around the world to set up professional training courses for medical, legal and education personnel. Additionally, through distance learning, California Polytechnic University San Luis Obispo and Cuesta College could work together to build virtual satellite campuses in several key locations in the county. Distance learning can ultimately enable educators to accommodate greater numbers of students. Students can have the added advantage of being able to ‘attend’ classes at their own convenience which helps increase access to education for working individuals, parents and other caregivers.

Cal Poly is actively increasing the use of online technology by providing Internet access and training to its students and faculty. Cal Poly is ahead of most CSU campuses in terms of technological capability. However, the increased use brings with it a need for increased support services that can be difficult to provide due to budget issues. For example, some classes are now organized to include extensive use of e-mail and someone must set-up the system for each class. Cal Poly has sophisticated video conferencing facility that can be used for distance learning, but

does not have the funds to administer ongoing programs. In order for distance learning to take place via videoconferencing, a facility or equipment must be in place on both ends.

Government Services

Many of the government services now accessed by commuting to centralized government centers could be converted to online transfer of information from the home or through a telecommunications facility. Licensing procedures, real estate titling procedures, permit applications, and many of the other information intensive applications particular to government could be included. The County of San Luis Obispo is working to provide public access to all County government information through its developing wide area network which would be accessible online.

As other government agencies develop similar networks it becomes imperative to link services and resources so that procedures requiring involvement with more than one agency are streamlined. Electronic technology provides the opportunity to reduce redundancy and improve efficiency for government and the public.

Telemedicine

Developing technology makes possible the high-speed transmission of graphic and video images associated with advanced medical technology. Access to health care can be dramatically increased by the inclusion of health-care issues in the development of telecommunications and telecommuting. For instance, the San Luis Obispo Home Health Care Network provides nursing care to homebound individuals. The ability to consult with physicians on-line would increase the quality and quantity of care provided by the agency. Local hospitals could take advantage of specialty services found in urban medical centers such as Stanford, UCLA and others worldwide. Today's digitized diagnostic information makes it possible for a rural patient to receive the benefit of a variety of experts without traveling to each one. In addition, health care providers worldwide can access training and acquire new skills that would otherwise be out of reach.

Telecommunications Facilities in Development

The following sites offer a variety of opportunities for the future development of a telecommuting facility.

1. *Templeton School District*

This school district has implemented high bandwidth and multi-media facilities for its own internal telecommunications and teaching needs. With bandwidth augmentation, the implementation of satellite communications, and physical site development on the school district's property, a telecommunications facility could be developed. This facility could centrally service the Paso Robles and Atascadero areas.

2. Paso Robles and Atascadero School Districts

Both of these districts have begun implementation of programs that will upgrade their telecommunications capabilities. Within two years both will have high bandwidth and multi-media facilities. Discussions could be opened concerning the possibilities of developing telecommunications facilities in cooperation with these districts.

3. Paso Robles City Library

This library was built to house high-bandwidth telecommunications. Its internal wiring can accommodate distance learning, video conferencing, and multi-media configurations. Any public/private partnership looking to develop a telecommunications facility in Paso Robles could open discussions with the city concerning the possibilities.

4. Innovation Development Center

This private entrepreneurial incubation center in Atascadero is committed to the development of small business by providing the tools necessary for development in an affordable, high-tech environment. Incubation centers are developing into an integral part of a community's telecommunications infrastructure.

5. Vines Spring Resort

This proposed multi-faceted development project in Paso Robles holds the potential for actually developing the Televillage Center envisioned in the Televillage concept discussed in detail in Part Two section VI of this report. With a strong financial commitment from an investment group highly familiar with current technology, a multi-faceted telecommunications facility could be developed in the near future. As envisioned, this proposed project would offer video conferencing, distance learning, a business incubation center, telecommuting services, and a community-based skills training center.

GENERAL FINDINGS

A. Telecenters in General Are Presently Not Operating at Full Capacity or Without Subsidy

The concept of telecenters is a good one, and one that should be pursued and refined in the appropriate context. However we have found that for a variety of reasons they have not yet developed their full potential. At this time, Antelope Valley Telebusiness Center is the only telecenter in California known to be self-sustaining and this is a very recent development. The Health Net Corporation serves as an anchor client by occupying 33 out of 49 workstations in one of two facilities. None of the other known telecenters is functioning on a comparable level. We have found six reasons why this is so:

- 1) General Misunderstanding of the Concept and Benefits of Telecommuting by Potential Clients

- 2) Inadequate Marketing
- 3) Management Resistance to Change
- 4) Narrow Scope of Offerings
- 5) Over Reliance on Public Funding
- 6) Government Agencies are Not Using Telecenters

B. Home Based Telecommuting is Viable

Home-based telecommuting is the building block upon which a successful telecommuting program can be built. In addition to the rapid technological improvements and cost reductions in home-telecommuting equipment, business is already using it. For the uninitiated, the move to a telecenter with the attendant costs, management issues and policy changes may at first seem an insurmountable obstacle. Home-based telecommuting is often established proactively by competent, trusted employees who can successfully demonstrate the advantages of telecommuting. Encouraging employers to seek out suitable employees to begin or increase home-based telecommuting will provide the foundation that can eventually be expanded to include telecenters for employees who are not able to telecommute from home.

C. A Definite Need for Education and Training Exists

Government, private business and the general public clearly demonstrate a lack of understanding of what telecommuting is and what it affords in the way of opportunity. Clearly there is a need and desire for education and training on the concept and the tools available for telecommuting.

CONCLUSIONS

- A. The results of this study show that while there is significant political and private sector momentum towards the development of telecommuting and telecommunications in the North County, the evidence collected would indicate that the current market base for a stand-alone telecenter is limited and underdeveloped.
- B. The potential market for a variety of multi-use facilities serving a broad scope of telecommuting and telecommunications uses countywide is substantial.

RECOMMENDATIONS

- A. Develop Non Site-Specific Telecommuting Before Developing a Telecenter
- B. Use the North County as a Launch Site for Implementing a Regional Telecommunications and Telecommuting Plan
- C. Follow The Recommendations Listed in **Part Two**, Section IX, of this Report

PART 2: The Development of Telecommuting in San Luis Obispo County

Much of the original research for the North County Telecommuting Feasibility Study was expanded and applied to the entire County. This part does not address site analysis, cost and market base, specific to establishing a telecenter or similar type of facility. It does, however, address the broader scope of issues relevant to the development of telecommuting and telecommunications overall.

Transportation Issues for San Luis Obispo County

Transportation issues have been viewed historically as the provision and maintenance of streets, roads, and highways, and, to a lesser degree, mass transit and other transportation alternatives. The transportation issues facing communities throughout America and San Luis Obispo County are declining air quality, traffic congestion, parking shortages and a host of problems that accompany the increasing reliance on single occupant vehicles.

The vehicular miles traveled in San Luis Obispo County is increasing faster than the general population resulting in a growing emphasis on problems associated with commuter traffic. The majority of communities in San Luis Obispo County function in some way as satellite communities for the City of San Luis Obispo. Fifty-one percent of jobs in San Luis Obispo County are located in the City of San Luis Obispo. Many county residents also attend school, shop or conduct business in the City of San Luis Obispo.

Telecommuting as Transportation

Modern technology has opened the door to a new perspective—moving information instead of people. Telecommuting and telecommunications are now viewed as tools of transportation, rather than simply communication, by federal and state highway departments, air quality control boards, energy departments and other wide-ranging agencies. Widespread implementation of telecommuting can fulfill many of the policies and objectives outlined in the *California Transportation Plan* issued by the State of California.

Using recent employment figures, 4,794 workers in San Luis Obispo County could be traveling the information highway on a regular basis if the infrastructure was in place to bring San Luis Obispo County up to the statewide estimate of current telecommuters (6% of all workers). More than twice that number of jobs in San Luis Obispo County (11,985) are *suitable* for telecommuting.

The *UCSB Economic Forecast Project* has estimated 23.9% (19,100) of all workers in San Luis Obispo County are employed by the government, we can estimate 2,865 *eligible* jobs in

government alone. A recent San Luis Obispo Rideshare Agency Survey showed 83% of commuters reported driving alone as the most common mode of transportation. These figures translate into 2,377.95 single-occupant, work-related, one-way trips that could be eliminated daily, county-wide, by the implementation of home-based telecommuting for government workers alone.

In practice, a typical telecommuter only telecommutes one or two days each week. Telecommuting twice a week can eliminate 4 trips per five-day week according to *Telecommuting and Travel Demand*, produced by the Transportation Research Group at UC Davis (Kitamura *et al.*, 1990). That translates into 47,940 trips per five-day week that could be eliminated if telecommuting was practiced by all employees with *suitable* jobs. If telecommuting was practiced two days per week at the statewide average of 6% of the workforce, it would eliminate 19,176 trips per five-day week.

Using the analysis applied to the North County, described in **Part One**, Section IV of this report, we can make similar comparisons for San Luis Obispo County. For more detail, please refer to that section.

Analysis #1

Table 10: Vehicle miles eliminated by Countywide Telecommuting

Type and Volume of Telecommuters	vehicle miles eliminated each workday
Home-based at current statewide average	68,554.2
Home-based/ all suitable jobs	171,385.5

The following figures were used to compute the above table:

- 43,945 workers (55%) in San Luis Obispo County commute
- The average commute distance (countywide) is 13 miles one way (26 miles round trip).

Analysis #2

San Luis Obispo County could reduce 221,482.8 miles of weekly VMT by implementing telecommuting in the workforce employed in jobs suitable for telecommuting who work outside of their community of residence.

The above analysis considers the decrease in *non-work* trips associated with telecommuting found in analysis #3 in *Part One*, Section IV. of this report.

Analysis #3

Table 11: Estimated Trip Reductions Generated by Telecommuting in San Luis Obispo County

Segment of San Luis Obispo County Workforce Telecommuting 2 Days / Week	Number of Trips Eliminated Per Five-Day Week
6% of all workers (4,794 workers)	19,176
All workers with suitable jobs (11,985 workers)	47,940
6% of government workers (1,146 workers)	4,584
All government workers with suitable jobs (2,865 workers)	11,460

The above table is computed using the following estimates:

- 4 vehicle trips can be eliminated per five-day week in which an employee telecommutes two days.
- The current employment in San Luis Obispo County is 79,900 workers

Bedroom Communities for San Luis Obispo

The City of San Luis Obispo is losing population while most outlying communities are growing. Many of the services needed and desired by county residents remain in the City of San Luis Obispo. A well-developed telecommunications infrastructure can make many of the city's resources accessible from a remote location, or from private residences.

Air Pollution

San Luis Obispo County comprises an air quality district, which means an air quality violation anywhere in the county is considered a violation for the entire district. Improving air quality at any one location therefore benefits the entire county. The effect of implementing telecommuting for the entire county would have a benefit many times that of solely implementing it in the North County.

Traffic Congestion

The VMT reduction described above in analysis #3 is calculated by using only the estimated potential number of people telecommuting to work in San Luis Obispo County based on current employment statistics. A fully developed county-wide system could include a greater number of telecommuters and students, shoppers, tourists and people accessing services of all kinds. The increased flexibility for the greater population would improve traffic congestion.

Urban Parking

Parking issues in San Luis Obispo County vary considerably from community to community. Incoming traffic from the entire county (including North County) impacts the City of San Luis Obispo. The net benefits of telecommuting relative to improved parking in the City would increase proportionally to the number of communities included in a regional telecommuting program. Telecommuting from a telecenter shifts the burden of providing parking to less prime real estate, and home-based telecommuting eliminates the need for work-related parking altogether.

Economic Benefits of Telecommuting for San Luis Obispo County

The economic benefits of telecommuting and telecommunications development are tied to the improved efficiency of moving goods and services offered by telecommunications technology. Improved efficiency results in greater cost effectiveness which in turn improves competitiveness. Not only does telecommunications technology improve access to vital information that helps business, it also can dramatically increase the market base for business by increasing access to customers that are otherwise out of reach. A region that develops telecommunications technology will be able to attract new businesses, sustain existing businesses and prosper economically in the same way towns that linked to the railroads grew and prospered. Telecommunications is expected to represent 20% of the national economy by the year 2000. The economic benefits of an emerging industry of this magnitude are complex, far reaching, and will ultimately be represented on a macroeconomic scale. The impact of the telecommunications industry in the 21st century will be compared to (and likely surpass) the impact of the emergence of the oil and steel industries in the 20th century.

While those factors make it difficult to quantify benefits, we can make the following conservative estimates based strictly on low-end cost savings per telecommuter traditionally experienced by companies (*Perey 1994*).

Business and Government Combined

By applying the low-end estimated annual cost savings per telecommuter (\$8,000) to the estimated number of jobs suitable for telecommuting held by workers in San Luis Obispo County (11,985), we can estimate combined savings of \$95,880,000 annually for San Luis Obispo County employers. If employed County residents were telecommuting at the statewide average of 6%, the annual benefit to their employers would be \$38,352,000. If the actual savings experienced in San Luis Obispo County were one quarter of the low-end industry standard, the estimated annual savings would be \$9,588,000 with 6% of the workforce telecommuting.

Government Only

Government employed 19,100 county residents as of June 1995 (Telegram Tribune). Using the estimate that 15% of those jobs are suitable for telecommuting we can estimate 2865

government jobs countywide suitable for telecommuting. An \$8,000 per employee cost benefit would result in a combined benefit of \$22,920,000 with telecommuting implemented for government jobs held by San Luis Obispo County residents. If all San Luis Obispo County residents employed by government were telecommuting at the statewide average rate, government would save an estimated \$9,168,000 per year. By reducing the estimate to one quarter of the low-end industry standard, government would save \$2,292,000 annually.

Technological Development of San Luis Obispo County

San Luis Obispo County is developing telecommunications technology on a variety of levels that will ultimately lead to the extensive utilization of telecommunications for businesses, government, and individuals. Countywide telecommunications development will allow for development of telecommuting, distance learning, telemedicine and other services. It will also create a technological environment for expanded economic development, including attracting high-tech industries to San Luis Obispo County.

The following groups have taken the lead in telecommunications development discussions in San Luis Obispo County:

Caltrans District Five

This state agency has demonstrated support for developing the telecommunications infrastructure through the advancement of grant money to study the possibilities of telecommuting in the North County. With appropriate flexibility, Caltrans has opened the study to discussions regarding all of San Luis Obispo County, and it has indicated initial support for assisting in preserving the momentum created by the study.

San Luis Obispo Council of Governments

An advocate for telecommuting and a strong supporter in the political arena, SLOCOG initiated and supported the development of the Regional Network Consortium (described below), as well as administered and provided guidance in the North County Telcommuting Feasibility Study.

Regional Network Consortium

This group is dedicated to and highly focused on developing the high-bandwidth infrastructure and Internet access needed for utilitarian telecommunications throughout the county, specifically in the semi-rural areas not easily serviced for these two needs. The group consists of representatives from Cal Poly, Cuesta College, Pacific Bell, San Luis Obispo Council of Governments, San Luis Obispo Chamber of Commerce, Nipomo Area Advisory Group, San Luis Obispo County Government, including the schools, library, information services, and other agencies, and the City of San Luis Obispo.

The Emerging Technologies Committee of San Luis Obispo

This group formed in 1993 to advocate and to promote the development of a viable telecommunications infrastructure in San Luis Obispo County that will attract high-tech industry to this area thus creating jobs. It is a prime mover in putting together the Electronic Village Conference, a symposium dedicated to educating about telecommunications and advancing the idea that the tools of today are applicable and useable. Represented by most all of the groups associated with the Regional Network Consortium, it has the added influence and input of private businesses.

The Regional Technological Alliance

This newly formed, state designated agency has been set up to channel Department of Defense conversion dollars into the region comprised of San Luis Obispo and Santa Barbara Counties. Dedicated to developing projects that will enhance the telecommunications infrastructure in this large region, it is also focused on creating jobs in the high-tech arena.

North County Telecommuting Coalition

This group formed as a direct result of the Caltrans sponsored study. The group consists of many diverse elements in the community including over 100 representatives from government and the private sector. The group will likely be instrumental in the development of telecommunications projects in San Luis Obispo County.

Nipomo Area Advisory Group

This group is highly dedicated to bringing a strong, centralized telecommunications facility into the Nipomo Basin area. If realized, it could service commuters in southern San Luis Obispo County and the Santa Maria area.

Paso Robles Opportunities for Business and Education

This non-profit group has been setup to advocate and promote the development of business and educational opportunities in the Paso Robles Region through the use of advanced technology. This group is a recognized leader in pursuing technological development in the Paso Robles area. PROBE is a non-profit candidate to house the telecommute coordination activity recommended in the latter part of this report.

Consortium For Community Media

This consortium is dedicated to developing partnerships between educational and governmental institutions, and the private sectors in San Luis Obispo County. It's purpose is to build alliances that will be able to take "advantage of the emerging technologies that are not available to individual institutions and harness the power of the technology in cost-effective ways."

The consortium formed in 1994 and has Contributing Members, Task Force members, and Friends of the Task Force. The Contributing Members are Arroyo Grande, Atascadero, Grover Beach, Paso Robles and the City and County of San Luis Obispo.

All of these groups are powerful advocates for the development of telecommuting in San Luis Obispo County; however, recognizing their existence points to a key issue. A cohesive and coordinated effort is essential to achieve success. See Appendix F for contact numbers.

The development of a viable telecommunications infrastructure will set the stage for San Luis Obispo County to link with other technologically developed regions in the future.

Existing Infrastructure

Cable Access

Currently San Luis Obispo County has agreements with Sonic Cable and Falcon Cable to develop community-based programming that could ultimately lead to interactive distance learning. Falcon Cable has implemented a fiber-optic network that connects Atascadero, Santa Margarita, Templeton, Guadalupe, Cambria and Los Osos. Cable access programming is a viable and integral part of the infrastructure necessary to develop wholesale telecommunications in San Luis Obispo County.

Video Conference and Distance Learning

Three known entities have videoconferencing capabilities in San Luis Obispo County. None of the facilities are accessible to the general public.

Cal Poly currently is technologically capable of supporting distance learning and video conference operations but lacks funding to provide an ongoing program. It also has access agreements with local cable companies, however, the university does not have a transmitter in place that would allow for microwave broadcasting of its curricula. In addition, Cal Poly is linked to a fiber optics network.

Atascadero State Hospital currently operates a state-of-the art videoconference facility dedicated to hospital business.

Caltrans has a videoconferencing network linking each of its 12 districts.

Integrated Digital Services Network

Pacific Bell, as part of its long range business plan, is implementing its Integrated Services Digital Network (ISDN) throughout San Luis Obispo County. ISDN has high-bandwidth capability, thus the transfer of video and graphic images can be accomplished. This allows for all forms of telecommuting. With its high-bandwidth capability, ISDN could become the “backbone” that could accommodate widespread use of high-bandwidth telecommunications either in the North County or the entire San Luis Obispo County. ISDN is available on a fee for service basis and is more widely used by businesses than individuals at this time. ISDN phone line installation costs approximately \$240, necessary hardware costs about \$350 and up, and monthly use fees range from \$30/month to an additional per-minute charge for greater bandwidth.

Fiber Optics

Fiber optics technology is available, but not widely accessible at this time. Fiber optic cable is in place and is being leased by telecommunications providers. However, all areas other than the City of San Luis Obispo would have to finance the construction of a connecting link which could be cost prohibitive. The City of San Luis Obispo is taking advantage of its existing link by laying fiber optics cable in conjunction with other construction projects. The cable runs the length of the county adjacent to the railroad tracks in a right of way access granted by Southern Pacific Lines.

Wide Area Networks

The County of San Luis Obispo has begun the process of creating a Wide Area Network (WAN) that will link up all of its 12- 1300 computers. Paso Robles, Atascadero, Templeton, San Luis Coastal, and the Lucia Mar school districts all are either developing or proposing to develop Wide Area Networks in their districts. Cal Poly and Caltrans have Local Area Networks (LAN) and WAN's in place. Thirty-two out of 155 businesses (20%) surveyed in San Luis Obispo are connected to a WAN, 38 (24.5%) are connected to a LAN, and 10 are connected to both.

Online Services

The public has been offered access to SLONET, San Luis Obispo County's non-profit community information access bulletin board since September 1994. A monthly user fee is charged and until recently, there has been no toll free access from areas outside of the City of San Luis Obispo's local calling area. Currently, the North County and Santa Maria have toll free access.

Several commercial online services also provide Internet access, World Wide Web access, and e-mail services in San Luis Obispo County at this time.

Livable Communities

The concept of livable communities is not new. It is based on the idea that a so-called bedroom community for an urban area should provide residents with much more than a place to park a vehicle and own or rent a home. It means shopping, working, conducting business and living within your community. In San Luis Obispo County we experience a different kind of urban sprawl than areas such as Los Angeles County. Outlying communities are often geographically separated and fully developed in their own rights, yet often lack certain services and amenities otherwise available in the City of San Luis Obispo. This is particularly true for unincorporated areas. Telecommunications offers the opportunity to electronically link these communities to many of the desired services while improving, rather than creating, traditional transportation issues. Research shows people who work in communities in which they reside increase community involvement in general which benefits individuals and society as a whole.

One key to livable communities is the creation of multi-use centers, large and small, that include telecommuting support facilities and also provide access to a variety of community resources and services. For those who could telecommute, but cannot do it out of their homes, these centers would offer an alternative site. Projects are currently underway that include telecommute work centers built into large apartment complexes, or housing developments, for use by the residents. The development of telecommunications will allow San Luis Obispo County to pursue similar housing design opportunities. By providing many of the traditional office tools in such a center, telecommuting could become a realistic alternative to driving to work, thus keeping people in their neighborhoods and sharing more in the quality of life issues that impact all of our lives.

Telecommunications can contribute to maintaining the quality of life experienced in San Luis Obispo County by reducing air pollution and traffic congestion, creating a more competitive business environment, improving access to education and creating a common vision for community development. Maintaining the quality of life will have direct impact on future economic growth. According to the *1995 UCSB Economic Forecast*, quality of life is cited as the second most common reason for businesses to locate in San Luis Obsipo County.

Televillages: A New Approach

The influence of the global information economy is changing patterns of business and community life. Traditional development tools are being replaced by access to information and ideas as a primary means of creating and sustaining economic growth. The means are available now to enable rural areas to innovate, strengthen economic development capacity, expand educational opportunities and health-care through the construction of information gateways such as a Televillage. The Televillage initiative is an effort of the Kentucky Science and Technology Council, Inc. (KSTC), together with a variety of public and private agencies to advance science, technology and innovative economic development. The creation of the Televillage concept emerged from the exploration of ways that telecommunications and information resources can be

used to build and extend development capacity in rural areas. Through the efforts of KSTC, Televillages are in development in Kentucky, other states, Great Britain, Poland and Australia. KSTC acts a guiding resource for the individuals and groups promoting Televillage development in their region.

While San Luis Obispo County may not be classified as rural according to Kentucky standards, it is significantly more rural than other large population centers in California. For this reason, telecommuting in San Luis Obispo County demands an alternative development strategy to those used in densely populated urban areas.

How Televillages Function

The Kentucky Science and Technology Council describes a Televillage in the following way:

“A Televillage can be understood as a virtual community of people, firms, government agencies, schools, libraries, health-care providers and others connected through a common vision or need and linked through telecommunications, information resources and shared services. A Televillage is characterized by dynamic new patterns of human interaction, cooperation, communications and development.”

A Televillage may operate on its own or in tandem as a satellite to another larger Televillage. Televillages can develop slowly according to the needs and available resources of each participating area. A Televillage Center is an actual facility that serves as the “town square” for the Televillage. KSTC envisions the center (or centers) as a “public and private mixed-use facility providing a comprehensive package of services to the larger Televillage. The center can support a variety of customers with services provided on-site or remotely. Office space may be available and organizations may be part of or consolidated with the center.”

Who Can Benefit from a Televillage

Companies, schools, libraries, workers, health-care providers, government and citizens or civic organizations can all benefit from the development of a Televillage. Furthermore, Televillages provide the stimulus and resources for entrepreneurs to start new businesses and for existing firms to expand. The Televillage can encourage and enable professionals of all kinds to remain in the area or move to the area. The primary economic focus is to stimulate growth and job creation from within.

Funding

The Televillages and centers are proposed as viable market-driven operations supported by solid business plans. The private business perspective helps mitigate the negative effects of long-term subsidization. The initial start-up costs might be financed by a combination of public, private and foundation grants, similar to other telecenters in California. With today’s declining

government resources, innovative financing ideas and partnerships such as community-owned development corporations may provide the cornerstone of emerging technologies development.

How Televillages Apply to San Luis Obispo County

By developing a regional telecommuting plan that links the outlying communities with resources in the County Seat, the individual communities and the entire region will benefit. The advantages to developing a Televillage instead of isolated telecenters are:

- The extensive community planning associated with the process of building a Televillage helps create a common regional vision.
- The Televillage enables the region to organize, pool and manage resources that might not be affordable or practical for individual communities.
- The Televillage expands and extends the capabilities of government, businesses and schools which adds value and promotes economic growth. Additionally, the growth occurs in a non-traditional manner that benefits the environment and helps create livable communities.
- A Televillage helps the region take full advantage of the global information economy.

GENERAL FINDINGS

A. Telecommunications Infrastructure Needs More Development

Although many important telecommunications elements are in place and being utilized at this time, more development is needed before San Luis Obispo County will have a cohesive, high-bandwidth, infrastructure that will service businesses and individuals on a comprehensive, cost effective scale.

B. Telecenters Are Most Viable as *Pieces* of a Larger Network.

The same obstacles to successfully marketing a stand-alone telecenter in the North County at this time can be applied to the county as a whole. Telecenter development must provide diverse services and be accompanied by education, training and marketing, and be linked to a greater telecommunications network.

C. San Luis Obispo County Can Benefit From the Development of a Cohesive Telecommunications Network

The benefits of telecommunications and telecommuting relative to the North County exist for the entire county and would be increased if telecommunications and telecommuting are developed countywide. Telecommunications development will allow for development of telecommuting, distance learning, telemedicine and other services that rely on emerging technology.

D. There is a Broad Base of Support for the Development of a Telecommunications Network

There is sufficient political and private sector momentum towards the development of telecommuting and telecommunications in San Luis Obispo County to successfully move forward toward the development of a regional program.

CONCLUSIONS

A. Absolute Need for Education About Telecommunications and Telecommuting

Business, government and the general public require more information, training and a better understanding of what telecommunications and telecommuting are, and what they can do, before they will be able to significantly utilize the technologies and associated applications.

B. Need to Create Self-Sustaining Telecommuting Programs

Disappearing public funds dictate that new endeavors must be developed in an entrepreneurial fashion that eliminates taxpayer subsidies in a timely, certain manner and fosters economic growth. Current models of development of telecenters have not proved to be successful in this area thus far.

C. Telecenter Concept and Model Must be Modified and Expanded

A broad base of services and resources must be available from a facility in order to serve the cross-section of users required to attain self-sufficiency. The Televillage and Smart Community models provide formats for creating a regional telecommunications network which can ultimately support a variety of community based telecenters.

D. Local Government Needs to Fully Participate in Telecommuting

The large percentage of government jobs combined with the relatively small number of large corporations in San Luis Obispo County creates the imperative that government fully participates if telecommuting is to be successfully implemented countywide. Government must create opportunities for citizens to access services as well as implement government employee telecommuting programs. Home-based telecommuting provides an opportunity for government participation considering budget constraints that might preclude utilization of a telecenter at this time. However, in a fully developed telecommunications environment, such as a Televillage or Smart Community, the savings associated with telecommuting would apply to government the same as they apply to

business in general and the use of a telecenter would likely become cost effective.

RECOMMENDATIONS

We recommend the following eight steps to pursue the development of telecommunications and telecommuting in San Luis Obispo County

1. Establish a Regional Telecommuting Coordinating Agency

Although the necessary elements to develop telecommuting and telecommunications may possibly evolve slowly on their own, without leadership and management they will not likely advance in a timely, substantial, or cohesive manner which will allow for interactivity or sustained support on a county-wide basis. We recommend that local and state government support the development of a regional telecommuting coordinating agency contracted to local government. Further analysis is required to determine the best method of structuring the proposed agency. It may be feasible to establish the proposed agency under the auspices of an existing non-profit, for-profit, or public entity.

2. Create an Aggressive Education and Advocacy Program

We recommend adopting an aggressive approach to promote all forms of telecommuting and the use of available telecommunications technology in business. This would be implemented through a vigorous education and advocacy program sponsored by city and county government.

3. Create a Five-year Plan for the Development and Implementation of Televillages or Smart Communities in San Luis Obispo County

We recommend developing and implementing a five-year plan that supports home-based telecommuting in the beginning and moves toward developing the Televillage or Smart Community concept. Telecenters would eventually serve as the vital links to the wider telecommunications network (see Appendix A).

4. View the Development of Telecommuting and Telecommunications in General From a Private Business Perspective

It is important to view the development of telecommuting and telecommunications in general from a private business (profit based) perspective so that facilities are planned with the goals of self-sufficiency and the ability to foster regional economic growth.

5. Establish Pilot Programs Supporting Home-Based Telecommuting in Government and Business

We recommend implementing carefully designed and monitored pilot programs supporting home-based telecommuting in government and business *as a first step*. These programs should include training and a system for tracking the programs' progress.

6. Pursue Public/Private Partnerships to Develop Telecommunications Countywide

We recommend that a telecommunications network be developed via public-private partnerships throughout the county so that future needs of a variety of users can be met by a variety of providers acting cooperatively.

7. Actively Support Pro-Telecommuting Legislation

We recommend that local government maintains active involvement with individuals and agencies proposing legislation related to the development of telecommuting. We also recommend that local government pursue opportunities to create development incentives for telecommuting related development.

8. Advocate Inclusion of Telecommunications Questions in Local, State and National Data Collection Efforts.

Essential, precise, information can be obtained by updating existing data collection efforts (including the next census in 2000) regarding telecommunications technology use and distribution in households and businesses.

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APPENDICES

Appendix A: Proposed Televillage Five-Year Plan

A General Overview

Proposal

That the San Luis Obispo Council of Governments adopt and implement a five-year plan to develop the “Televillage ” concept as it is being modeled by The Kentucky Science and Technology Council Incorporated in the State of Kentucky, and as it is being cooperatively developed under the name of “Smart Communities” by the California Department of Transportation and the University of San Diego for the purposes of : connecting San Luis Obispo County to the developing international telecommunications infrastructure; coordinating and encouraging the development of telecommuting; fostering the creation and development of small businesses; and creating an environment in which high-tech industrial concerns can flourish. Because the Televillage model has been specifically developed for application to non-urban areas, such as San Luis Obispo County, we have chosen to provide the overview of that model in this five-year plan.

Televillage Overview

The influence of the global information economy is changing patterns of business and community life. Traditional development tools are being replaced by access to information and ideas as a primary means of creating and sustaining economic growth. The means are available now to enable rural areas to innovate, strengthen economic development capacity, expand educational opportunities and health-care through the construction of information gateways such as a Televillage .

The Televillage initiative is an effort of the Kentucky Science and Technology Council, Inc. (KSTC), together with a variety of public and private agencies for the purpose of advancing science, technology and innovative economic development. The creation of the Televillage concept emerged from the exploration of ways that telecommunications and information resources can be used to build and extend development capacity in rural areas. Through the efforts of KSTC, Televillage s are in development in Kentucky, other states, Great Britain, Poland and Australia. KSTC acts a guiding resource for the individuals and groups promoting Televillage development in their region.

While San Luis Obispo County may not be classified as rural according to Kentucky standards, it is significantly more rural than other large population centers in California. For this reason, telecommuting in San Luis Obispo County demands an alternative development strategy to those used in densely populated urban areas.

The Kentucky Science and Technology Council describes a Televillage in the following way:

“A Televillage can be understood as a virtual community of people, firms, government agencies, schools, libraries, health-care providers and others connected

through a common vision or need and linked through telecommunications, information resources and shared services. A Televillage is characterized by dynamic new patterns of human interaction, cooperation, communications and development.”

A Televillage may operate on its own or in tandem, as a satellite, to another larger Televillage . Televillage s can develop slowly according to the needs and available resources of each participating area. A Televillage Center is an actual facility that serves as the “town square” for the Televillage. KSTC envisions the center (or centers) as a “public and private mixed-use facility providing a comprehensive package of services to the larger Televillage. The center can support a variety customers with services provided on-site or remotely. Office space may be available and organizations may be part of or consolidated with the center.”

Companies, schools, libraries, workers, health-care providers, government and citizens or civic organizations can all benefit from the development of a Televillage . Furthermore, Televillages provide the stimulus and resources for entrepreneurs to start new businesses and for existing firms to expand. The Televillage can encourage and enable professionals of all kinds to remain in the area or move to the area. The primary economic focus is to stimulate growth and job creation from within.

The Televillages and centers are proposed as viable market-driven operations supported by solid business plans. The private business perspective helps mitigate the negative effects of long-term subsidization. The initial start-up costs might be financed by a combination of public, private and foundation grants, similar to other telecenters in California.

By developing a regional telecommuting plan that links the outlying communities with resources in the County Seat, the individual communities and the entire region will benefit. The advantages to developing a Televillage instead of isolated telecenters are:

- The extensive community planning associated with the process of building a Televillage helps create a common regional vision.
- The Televillage enables the region to organize, pool and manage resources that might not be affordable or practical for individual communities.
- The Televillage expands and extends the capabilities of government, businesses and schools which adds value and promotes economic growth. Additionally, the growth occurs in a non-traditional manner that benefits the environmental and helps create livable communities.

- A Televillage helps the region take full advantage of the global information economy.

Five-Year Plan Overview

San Luis Obispo County has an opportunity to “take the reins” on the fast moving telecommunications revolution that is spreading throughout the world and through the county. To leave the movement to develop on its own invites a disconnected set of telecommunications variables that might not yield valuable results for the county. In contrast, a coordinated and aggressive approach to developing the Televillage Concept could lead to many positive and rewarding results. For example, through encouraging the use of telecommuting on a wide scale, the county could develop a useful tool for dealing with air pollution, traffic congestion, and urban parking issues. By supporting the development of Televillage Centers, the county could create magnets for job creation through the development of small business in the area and the attraction of high-tech industry from outside the area. The centers would create access to information and educational resources that otherwise would not be so accessible.

In summary, the proposed plan would endeavor to create a series of interconnected programs that would all be linked through the effective use of today’s and tomorrow’s telecommunications tools. The heart of the plan would be the eventual development of three **Televillage Centers** strategically located in North, Central, and South County. This would be done through the creation of public/private partnerships that would have as their goal the weaning of the centers from subsidized status to self-sustaining status within three to five years. Income generation will come from providing a diversity of services that have value for both public and private concerns. Furthermore, the proposed plan would initiate dialogue with our neighbors to the north and south in the hopes of encouraging them to follow our lead. San Luis Obispo, Santa Barbara, and Monterey counties could be electronically linked as a broad-based region offering opportunities in a coordinated regional planning atmosphere that could lead to untold benefits for all three counties.

Funding Overview

Initially, the program would be funded by a coalition of public/private concerns that would have a vested interest in the development of the Televillage concept including, but not limited to, Caltrans, the San Luis Obispo Air Pollution Control District, the Regional Transit Authority, city and county governments, county school districts, California Polytechnic State University (San Luis Obispo), Cuesta College, Hancock College, Pacific Bell, the Regional Technology Alliance, specific local business interests, and telecommunications equipment manufacturers.

Fundamentally, all parties above, as well as the general populace have a vested interest in developing the Televillage concept. Therefore, since all will benefit, all should contribute. A shared funding effort is prudent in that individual “agency” costs are

requested according to financial ability and effective in that movement toward a common goal theoretically assures a coordinated effort.

Timeline Overview

Year One

- ◆ Develop Public/ Private Funding Partnerships
- ◆ Establish a *Regional Telecommuting Coordinating Agency*
- ◆ Develop and implement an “Educate and Advocate” plan
 - > Marketing and Public Relations
 - Business seminars and workshops
 - Newsletter
 - Public Speaking
 - Distribute “What Is and How To” information
 - Set up pilot projects for telecommuting
 - Encourage local government to support concept
- ◆ Implement Telecommute Training
 - > Offer workshops, seminars and hands-on classes
 - > Focus on management/employee and work environment issues
- ◆ Develop and implement Business Plan
 - > Centers will be self-sustaining within three to five years
- ◆ Encourage the development of government outreach centers

Year Two

- ◆ Design and implement a prototype Televillage Center
 - > Solicit equipment donations from telecommunications equipment manufacturers
 - > Set up to generate income immediately
- ◆ Implement Business Incubation
 - > Work with private sector concerns
- ◆ Implement High-Tech Job Training Program
 - > Contract with various Job Training agencies within and without San Luis Obispo County
- ◆ Implement Distance Learning
 - > Offer satellite classes for Cal Poly, Cuesta, and Hancock College
 - > Offer satellite Professional Training Courses for the medical, legal, education, and business communities
- ◆ Implement “High-Tech Business Office Environment” for small businesses and entrepreneurs
- ◆ Publicize project statewide and nationally

Year Three

- ◆ Establish a second Televillage Center In South County
 - > Electronically link the two centers
- ◆ Specifically target and market for out-of-area businesses
 - > “Sell” centers for use and as “hubs” for attracting high-tech industry
- ◆ Expand Televillage concept
 - > Open dialogue with Santa Barbara and Monterey Counties

- > Open dialogue with Santa Barbara and Monterey Counties
- ◆ Publicize statewide and nationally

Year Four

- ◆ Tighten and refine centers
- ◆ Reach self-sustaining status
- ◆ Establish a third Televillage Center in Central County
 - > Electronically link the three centers
- ◆ Publicize statewide and nationally

Year Five

- ◆ Cleanup all bugs and problems in centers
- ◆ Establish Televillage Centers in Santa Barbara and Monterey Counties
- ◆ Publicize statewide and nationally

Appendix B: City of San Luis Obispo Business Survey

This survey provides the results of a telephone poll of 155 businesses located in the City of San Luis Obispo and employing approximately 8,370 people, approximately 1,203 of whom live in the North County. Survey responses provide insight into the needs and attitudes of potential business users of a telecenter.

The sample was divided into four groups determined by number of employees in order to better identify the needs of businesses of various sizes. The groups are defined as follows:

- **Group 1.** 1-15 employees
- **Group 2.** 16-49 employees
- **Group 3.** 50-100 employees
- **Group 4.** more than 100 employees

For the purposes of this report, the cumulative results are presented, however, some reference to the breakdown according to size of business is noted. In most cases, the respondent was a manager of some sort although some were owners or CEO's. In all cases, the person interviewed said they felt qualified to respond for the company. Some of the numbers given by respondents are accurate and some are approximations. For the purposes of this survey, all numbers provided by respondents are considered approximate.

Local Businesses and Telecommuting Today

Of the 155 businesses surveyed, 106 (68 percent) said they are familiar with the concept of telecommuting and 37 respondents (24 percent) indicate they have a person on staff who handles issues dealing with telecommuting. At the same time, only 30 respondents (19 percent) said they actually have employees who telecommute. This indicates that some of the businesses are discussing telecommuting issues even though they do not have employees who telecommute at this time. We were unable to determine the *number* of employees telecommuting but discussions with respondents concerning the telecommuters indicate the number is very low. No respondent indicated a formal or scheduled telecommuting arrangement in place.

Because of the high percentage of the following type of comments made when question #3 was asked, the follow up question, "how many," was deleted from the survey.

Typical responses to question #3, *Do you have any employees who telecommute?*

"I know there's a couple of people who work from home every now and then."

“Sometimes the owner [telecommutes] and there might be one other guy, but it’s not very often.”

The correlation between the number of respondents who said they had been approached regarding telecommuting (36 respondents/23%) and the number of respondents who had telecommuting employees (30 respondents/19.3%) indicates that the discussion of telecommuting generally accompanies the activity and probably precedes it. Three respondents representing larger companies said they had never been approached about telecommuting but also said someone in their company telecommutes. The most likely explanation is that the telecommuter is an executive and does not need to process through the respondent.

Survey Questions 1-4:

1. Are you familiar with the concept of telecommuting?

Yes--106 No--49

2. Do you have a person who handles issues dealing with telecommuting?

Yes--37 No--118

3. Do you have any employees who telecommute?

Yes--30 No--123 Don't know--1 Planning--1

4. Has anyone (including employees) approached you about telecommuting?

Yes--36 No--119

Local Businesses and Technology Today

An overwhelming 150 respondents (97%) said computers are used at their San Luis Obispo business. Approximately 2,278 computers are used by businesses employing a total of 5086 employees. A much smaller number, fifty-eight respondents (37.4%) said their company uses e-mail. At those 58 companies, 39.7% of employees use e-mail. Of the companies that use e-mail, the smaller companies reported a higher percentage of employee participation than did the larger companies. The breakdown is as follows:

- Group 1. 1-15 employees-----89.7% employee participation
- Group 2. 16-49 employees-----50.9% employee participation
- Group 3. 50-100 employees-----18.6% employee participation
- Group 4. 100+ employees-----39.2% employee participation

Surveys on which respondents said they “did not know” how many employees used e-mail were excluded from the above computations.

Slightly more businesses said they use e-mail to communicate within the company than outside of the company, 22.4% use e-mail for both purposes.

51.6% of companies surveyed are connected to some sort of network.

Survey Questions 5-9:

5. Does your company use computers?

Yes--150 No--5

6. How many? 2,278 computers for 5,086 employees

(Six respondents with a total of 2,363 employees didn't know how many computers were used and were excluded)

7. Does your company use e-mail?

Yes--58 (37.4%) No--90 Don't Know--5 Planning--2

8. How many employees use e-mail? 1,823--out of 4,604 employees=39.7%

(Employees of respondents who did not know how many employees use e-mail were excluded from the aggregate.)

8a. Do you use e-mail to communicate between employees within the company--25

or to communicate with people outside the company--20 Both--13

9. Is your company connected to a wide area network--32

or a local area network--38 Both--10 Don't Know--8

Local Businesses and Telecommuting Tomorrow

Cost Savings was ranked number one as the top factor that would motivate respondents to initiate telecommuting in their business. Increased Productivity was rated number two, improved Employee Morale number three, Environmental Concerns number five and Governmental Regulations was rated six.

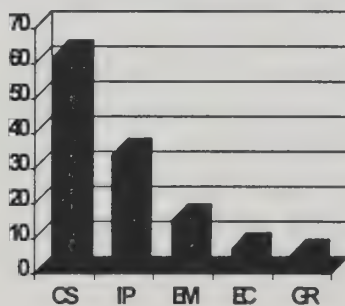
The responses indicate a clear cut need to convey to business the cost savings, increased productivity and employee morale benefits generated by telecommuting. A further conclusion can be drawn that environmental benefits and regulatory concerns can be more successfully be used to motivate business when presented as a secondary benefit rather than a primary goal.

A total of 117 respondents (75 percent) rated the following five issues in order of importance when asked what would motivate them to begin the process of implementing a telecommuting program. Thirty-eight respondents did not feel that telecommuting is relevant to their business and did not answer the question.

Survey Question #10:

“What would motivate you to begin the process of implementing a telecommuting program?”

<i>Factor</i>	#1	#2	#3	#4	#5
CS	62	33	13	7	2
IP	34	50	26	7	0
EM	15	21	55	22	4
EC	7	6	15	46	43
GR	5	5	8	33	66



The answers to the following question indicate that businesses are not going to be easily influenced by statistics. In other words, we need to “show” not “tell,” the benefits of telecommuting. While documented evidence is useful and necessary, it needs to be backed up by an experience that brings the evidence home, so to speak. Demonstration telecommuting programs within the industries and communities occupied by the target businesses provide a firsthand example as well as further documentation.

Respondents were asked how useful they thought the following five resources would be in setting up a telecommuting program. A total of 142 respondents (92 percent) rated the resources as essential, very useful, somewhat useful or not useful. Thirteen respondents did not answer the question.

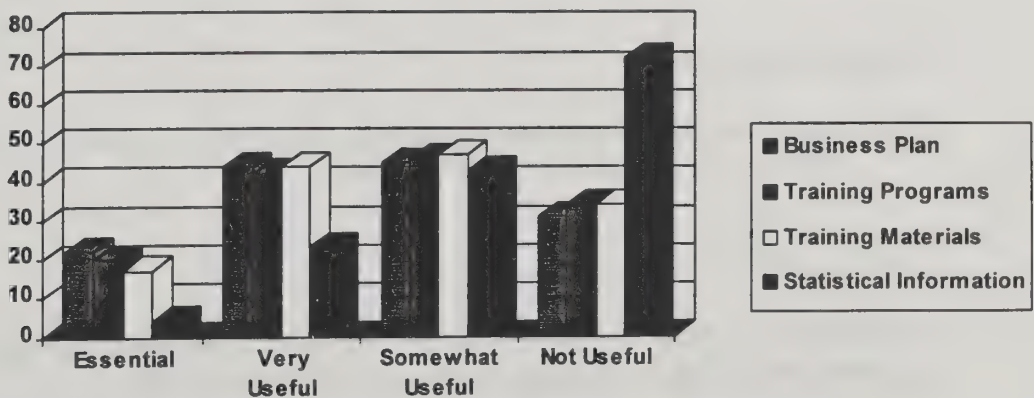
Survey Question #11:

Rate the following resources according to their usefulness in setting up a telecommuting program:

- Training Programs (TP)
- Training Materials (TM)
- Statistical Information (SI)
- A Business Plan (BP)

Perceived Usefulness of Telecommuting Planning Resources

	Essential	Very Useful	Somewhat Useful	Not Useful
Business Plan	22	44	45	31
Training Programs	20	42	46	34
Training Materials	17	44	47	34
Statistical Information	4	23	43	72



Note that 50 percent of the respondents feel statistical information is not useful to them, same time, The two most important motivational factors named in question #10

are factors commonly represented through statistics; cost savings and increased productivity. Therefore, when promoting telecommuting, it is important to present evidence of cost saving and increased productivity factors in a non-statistical fashion.

Slightly over half (52.2%) of all respondents said they would use videoconferencing to save money and time.

Responses to the final two survey questions point out an interesting conflict in perspective. Seventeen respondents (20.9%) who said they *would* use videoconferencing also said telecommunications tools are irrelevant to their business. Apparently they do not associate the ability to videoconference with telecommunication tools. Seven (41%) of those in conflict came from group #1 (1-15 employees).

43.8% of all respondents think the “new telecommunications tools are *irrelevant* to their business.” This figure conflicts with the 96.7% that already use computers. If we compare the 51% connected to a network to the 55.4% who think telecommunications tools are relevant, it appears that all but 4.4% of businesses which are likely to install a network have already done so.

While the wording of question #13 may have produced the conflicting responses, it is more likely indicative of a general lack of knowledge or confusion about telecommunications and its tools (for example, what they are and what they do).

Survey Question #12:

“If videoconferencing would offset or replace the time and money spent on traveling expenses for meetings, would your company use it?”

yes=81

no=55

don't know/no answer=19

Survey Question #13:

“Do you see the new telecommunications tools as being relevant to your business, or irrelevant?”

Relevant =86

Irrelevant= 68

don't know=1

CONCLUSIONS:

- A significant number of *businesses* are involved in telecommuting but an *insignificant number of employees* currently telecommute.

- Businesses in the City of San Luis Obispo are using computers and e-mail at rates consistent with business nationwide and are motivated to invest in technology by the same factors as business nationwide.¹
- The information gathered by this survey consistently highlights the need for increased education, outreach, and data collection efforts in order to advance the use of telecommunications and telecommuting in businesses located in the City of San Luis Obispo.

¹ U.S. Chamber of Commerce. *National Information Infrastructure Survey*, 1995

Appendix C: San Luis Obispo County Government Poll

This informal poll was designed to provide a sense of the attitudes toward telecommuting within San Luis Obispo County Government departments. Three State agencies were also included. Employees of thirteen County Government departments and three State agencies were asked the following questions concerning telecommuting activity within their department in a telephone interview. In most cases, the respondent was an administrator or supervisor within the department.

Questions:

1. How many people work in your department? **3,839**

2. Do you promote telecommuting within your department?

Yes--5 No--10 Don't know--1

2.a Do you have employees who work at home on an occasional basis?

Yes--10 how many?--20-24 employees* No 6

*2 departments said the number of occasional at-home workers "varied" and one did "not know" how many employees occasionally work at home.

2.b. Do you have employees who work at home on a scheduled basis?

Yes--1 how many?--2 No--14

2.b.1. (If so) Who provides the equipment? **The Department**

3. Do you lend portable computers to your employees?

Yes--6 No--10

4. Would you be willing to participate in a prototype program to try telecommuting in your department?

Yes--7 *No--3 *Maybe--4 Don't Know--2

* The two reasons cited for "no" and "maybe" responses were:
confidentiality of information and type of work is not suitable

5. Do you feel your employees are adequately trained to use telecommunication tools such as:

Telephone systems	<u>YES</u>	<u>14</u>	<u>NO</u>	<u>2</u>
Voicemail	<u>YES</u>	<u>12</u>	<u>NO</u>	<u>6</u>
E-mail	<u>YES</u>	<u>14</u>	<u>NO</u>	<u>2</u>
Fax	<u>YES</u>	<u>16</u>	<u>NO</u>	<u>0</u>
Fax-modem	<u>YES</u>	<u>5</u>	<u>NO</u>	<u>11</u>
Data transfer	<u>YES</u>	<u>3</u>	<u>NO</u>	<u>13</u>

(4 departments answered "yes" for all categories in question #5.)

6. Should the County encourage and support telecommuting as a concept?

Yes--16 No--0

Appendix D: Funding Resources

This list is not intended to be comprehensive, but represents known grant sources, potential grant sources, and organizations that have provided support on some level for existing telecenters.

Funding Recommendations

AB 2766 funds (Auto Registration Fees)
California State Department of Transportation (Caltrans)
Dept. of Commerce
Defense Conversion Matching Grant Program (State)
National Telecommunications and Information Administration grants (NTIA)
Petroleum Violation Escrow Account
Public Education Grant Funds
Regional Transportation Authority (RTA)
San Luis Obispo Air Pollution Control District (APCD)
San Luis Obispo Council of Governments
THAP grant program (Federal)

Foundations and Private Organizations (funding and/or support)

Anixter
Apple Computer, Inc
AT&T foundation
Berkeley Systems Inc.
Borland International
Digi International
Cheyenne Software
Claris Corporation
Compaq Computer Corporation
Datawatch
Digital Communications Associates, Inc. (DCA)
Eastman
GTE
Hayes Microcomputer Products
Hewlett Packard

IBM

Lotus Development Corporation

McDowell-Craig

Microsoft Corporation

Novell Inc.

Pacific Bell

Pacific Telesis Foundation

Smart Valley Corporation

Toshiba

Xerox

Appendix E: Telecommuting Resource Guides

The following resource guides contain useful information for businesses or government agencies interested in establishing telecommuting programs within an organization.

Title: Telecommuting Handbook

Source: State of California
Caltrans Publications Distribution Unit
1900 Royal Oaks Dr.
Sacramento, Ca., 95815-3800
Phone (916) 445-3520

Title: Statewide Operating Instructions for Employee Telecommuting

Source: Caltrans (11/22/1993)
Caltrans Publications Distribution Unit
1900 Royal Oaks Dr.
Sacramento, Ca., 95815-3800
Phone (916) 445-3520

Title: Telecommuting Resource Guide / Telecommuting Seminars

Source: Pacific Bell
Phone 1-800-378-1980

Title: Smart Valley Telecommuting Handbook

Source: Smart Valley
2520 Mission College Blvd., Suite 202
Santa Clara, Ca., 95054

Appendix F: Telecommunications Technology Development Contact List

District Five Caltrans

Linda Dolling / 271 South Street / San Luis Obispo, CA., 93401
Phone (805) 549-3648 / e-mail -- t5mail1.1dolling@trmx3.ca.g

San Luis Obispo Council of Governments

Dan Herron / 1150 Osos St. Suite E / San Luis Obispo, CA., 93401
Phone (805) 781-5711 / e-mail -- ipsocog@slonet.org

Regional Network Consortium

Steve Devencenzi / 1150 Osos St. Suite E / San Luis Obispo, CA., 93401
Phone (805) 781-4662 / e-mail -- ipsocog@slonet.org

The Emerging Technologies Committee of San Luis Obispo

Brandon Jones / 3430 Sacramento Dr. Suite A / San Luis Obispo, CA., 93401
Phone (805) 781-6424 / e-mail -- bjones@paccon.com

The Regional Technological Alliance

Dr. Rick Snody / 910 Stowell Rd. Suite C / Santa Maria, CA., 93454
Phone (805) 349-2633

North County Telecommuting Coalition

Dan Herron / 1150 Osos St. Suite E / San Luis Obispo, CA., 93401
Phone (805) 781-5711 / e-mail -- ipsocog@slonet.org

Nipomo Area Advisory Group

Beverly Chapman / P.O. Box 1499 / Nipomo, CA., 93444
Phone (805) 929-8004

Paso Robles Opportunities for Business and Education (PROBE)

Steve Martin / 801 4th St. / Paso Robles, CA., 93446
Phone (805) 239-7276

Consortium For Community Media

Ellen Sturtz / County Government Center Rm 207/ San Luis Obispo, CA.,
93408
Phone (805) 781-5252 / e-mail -- esturtz@slonet.org

Appendix G: Smart Communities

Guidelines For Developing Smart Communities in California

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GUIDELINES FOR DEVELOPING "SMART" COMMUNITIES IN CALIFORNIA

EXHIBIT A --- WORK PLAN

San Diego State University, the contractor, is responsible for the completion of all work described herein. There are five groups of tasks which constitute the work: situation analysis, community outreach, guidebook, dissemination of results, and project administration and coordination.

I. SITUATION ANALYSIS

This task group provides the foundation for the remaining tasks. It is intended that the inventory and analysis for this project be based on lessons learned from Caltrans' WorkSmart project and Davis Community Network projects and conducted as an early outgrowth of the Caltrans strategic plan to develop the "Electronic Highway alternative".

The contractor will conduct the following activities:

A. Literature Review

To establish basis for prototype "Smart" community developed from lessons learned in WorkSmart project, Davis Community Network project, and related projects by Caltrans and others working to develop the "electronic highway alternative". The following tasks will be required to complete the literature review process:

1. Conduct on-line searches and identify resources, databases, and existing inventories.
2. Identify and review white papers, legislation, etc.
 - a. Caltrans projects
 - b. Community networks and BBS
 - c. Components of smart communities
 - d. Educational institutions
3. Review funded smart community projects:
 - a. Federal (NTIA, NSF, etc)
 - b. States
 - c. Foundations
 - d. Private sector projects
4. Summarize, report and make report available through the World Wide Web.

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The literature review will be carried out in the first 10 weeks of the project . The following specific assignments will culminate in a review of appropriate literature:

Task Area	Institution Lead
WorkSmart	Center for New West
Caltrans Projects	UC Davis
Community Networks	UC Davis
Smart Communities	SDSU / CNW
Components of Smart Communities	SDSU / UC Davis
Telecommunications Projects	SDSU
Documents and World Wide Web posting	SDSU / UC Davis

PRODUCTS: Upon approval from Caltrans, written document and World Wide Web postings that summarize history and state-of-the-art of "Smart" communities including annotated bibliography. Reproducible briefing materials (text, overheads and handouts) for oral presentation and leave-behind events.

B. Inventory

What local governments, other state agencies, federal government, the private sector and other states and countries are doing about "Smart" communities and how the private sector and users are involved and relating same to economic competitiveness of California communities. The following tasks will be performed:

1. Set up criteria and select representative models in the following areas:
 - a. Local
 - b. Regional
 - c. State
 - d. National
 - e. International
2. Conduct interviews/surveys with technical project managers of model projects
3. Summarize and make report available through the World Wide Web.

The inventory task will be initiated in the 11th week of the project and continue until the 19th week of the project. The following specific assignments will culminate in an inventory and assessment of programs, projects, and initiatives:

Task Area	Institution Lead
Local Governments	UC Davis
State Agencies	SDSU / UC Davis
Federal Government	SDSU / CNW
Private Sector	SDSU / CNW
Other States & Countries	UC Davis
Documents and World Wide Web posting	SDSU / UC Davis

PRODUCT: Upon approval from Caltrans, written document and World Wide Web posting that lists programs, projects and initiatives concerning the Information Highway. Reproducible briefing materials (text, overheads and handouts) for oral presentation and leave-behind events.

C. Analysis of Situation

Assess the opportunities for the creation of "smart" communities in California:

1. Assess the following aspects of "smart" communities:
 - a. Individuals' needs
 - b. Tools
 - c. Technical infrastructure
 - d. Institutional infrastructure
2. Coordination with Caltrans TDM strategies
3. Value of smart communities for California
4. Summarize, write report and make report available through the World Wide Web.

The analysis task will be initiated in the 20th week of the project and continue until the 34th week of the project. The following specific assignments will culminate in an assessment of the situation.

Task Area	Institution Lead
Tools	SDSU / UC Davis
Technical Infrastructure	SDSU / UC Davis
Individual Needs	UC Davis
Institutional Infrastructure	UC Davis
Caltrans Strategies	SDSU / UC Davis
Smart Communities	Center for New West
Documents and World Wide Web posting	SDSU / UC Davis

PRODUCT: Upon approval from Caltrans, written document and World Wide Web posting assessing situation. Reproducible briefing materials (text, overheads and handouts) for oral presentation and leave-behind events.

The Situation Analysis task group will represent 10 percent of the total project budget.

II. COMMUNITY OUTREACH

Through another contract, Caltrans is looking at community telecommunications mobility when the drivers are forces other than the municipality itself. In that project, the community groups have taken the lead and the local government is a belated participant. Through this task group a companion model will be explored wherein the driving force is the municipality, which must seek out the diverse groups in the community for participation. These two models---one from the grassroots up and one from the top down---bracket the spectrum for creation of "smart" communities. The results from this

task group will be combined with the outcome of the model being explored through the other Caltrans contract to constitute the basis for the "How-to" guidebook (see Task Group III., below).

This task group represents the steps that will be taken by the second model approach to identify the products that consumers want or need to obtain mobility from a "smart" community, how much they are willing to pay for the product, and how the product will be brought to the community / marketplace. This will require an intensive, hands-on outreach effort including focus groups and appropriate materials, to identify the commitments and roles of interested community groups and organizations. The City of Chula Vista, which already has a noteworthy supply of "smart" facilities (telecenters plus school and library facilities) will thus serve as a test community for determining the vision, needs and demands for on-line services for residents and businesses and the mobility benefits to be gained therefrom. Conceptually, Chula Vista plans to establish a city-wide on-line community network (but not a stand-alone electronic bulletin board) which will provide:

- access to public information
- interactivity between the city's residents/customers and city departments for various items such as permitting, paying fees, etc.
- greater community participation in public policy issues, and
- accomodation of mobility demand via the information highway.

In establishing the program, the City has developed preliminary goals that this task group will seek to fulfill. The goals include

- provide better service to residents and serve the needs of the community in a more efficient manner
- reduce walk-in/counter traffic
- reduce auto trips to City Hall
- do so in a cost-neutral or revenue-generating manner.

The contractor will conduct the following activities:

- A. Engage the City to develop and activate a detailed project plan for the City of Chula Vista as a model municipality-driven community network and obtain buy-in from affected city departments, including:
 1. Working with project team and City departments, develop task group plan and city staffing plan for outreach tasks and obtain Caltrans approval. The experiences of the Davis Community Network/City of Davis and other relevant community networks (see Task Group I) will be considered as foundations for the Chula Vista outreach process.
 2. Working with project team, determine whether outreach function will be handled by city staff, in-house consultant or via RFQ/RFP for outside consulting services, include such determination in task group plan and obtain Caltrans approval.
 3. If RFQ/RFP for outside consulting services is chosen, develop RFQ/RFP and select outside consultant with assistance from project team.

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4. Pursuant to II.A.3, administer subcontract for outreach consultant services and ensure full coordination of said consultant's work with work of rest of project team.
- B. Conduct community needs assessment per the plan, including:
 1. Public workshops
 2. Scenario building workshops
 3. Council Visioning workshops
- C. Evaluate community response for value added to City/community, addressing :
 1. Technical issues and feasibility
 2. Economic feasibility
 3. Local public policy issues
 4. Estimated mobility benefit
- D. Prepare financing strategy and implementation recommendations for submittal to the City Council.
- E. Summarize, write report and make report available through the World Wide Web.

The Community Outreach task will be initiated in the first week of the project and continue until the 39th week of the project. The following specific assignments will culminate in a document detailing the community outreach process performed in Chula Vista:

Task Area	Institution Lead
Task group plan	Chula Vista / SDSU
Community Facilitation and community contacts	Chula Vista / Outreach sub / Center for the New West /SDSU
Local and Internal Coordination and City Council approval	Chula Vista
Analysis	Chula Vista /UC Davis / Center for the New West
Action Strategy	Chula Vista / SDSU
Documentation and World Wide Web posting	UC Davis / Center for the New West / Chula Vista

PRODUCT: Upon approval from Caltrans, written document and World Wide Web posting that details the community outreach process and identifies the services required by the residents and businesses of Chula Vista. Reproducible briefing materials (text, overheads and handouts) for oral presentation and leave-behind events.

The Community Outreach task group will represent 50 percent of the total project budget.

III. GUIDEBOOK

This task group will produce a document to be used in the development of the prototype "Smart" communities. The audience for the guidebook will consist of public and private sector entities interested in establishing their communities (or sectors thereof) as "Smart Communities". Building on the experience gained from the Davis and Chula Vista tests, the project team will suggest processes whereby communities can become "Smart" communities. The guidebook is also intended to assist Metropolitan Planning Organizations and other potential funders with understanding how to develop "Smart" communities at the regional level. The contractor will conduct the following activities:

A. Draft "How-to" Guide

Develop a draft guidebook for communities planning to access the information highway. Based on the literature review, project analyses, and experiences of the Cities of Davis and Chula Vista, create a first-cut draft guidebook that communities can use to establish themselves as "Smart" Communities. The Guidebook will identify the elements to be incorporated in the scope of setting up a "Smart" Community. These will include, but not be limited to:

- Delivery of Governmental Services
- Delivery of Educational Services
- Delivery of Community and Social Services
- Facilitation of Work and Commerce

The Guidebook will use a format that can be easily updated as communities progress through and complete their transitions towards establishment as "Smart" communities including the development of "Smart" community components as well as implementation of all "Smart" community system elements throughout the community.

B. Review and Comment of "How-to" Guide

1. Upon approval from Caltrans, circulate Guidebook to appropriate reviewers, soliciting input. The review process will include validation of the guidebook through meetings with the League of Cities, County Supervisors Association of California (CSAC), statewide associations of special districts, etc. and with metropolitan planning organizations responsible for regional transportation demand management functions.
2. Revise Guidebook as warranted by review and comment and submit to Caltrans for approval.

The Guidebook task will be initiated in the 35th week of the project and continue until the 52nd week of the project. The following specific assignments will culminate in a first-cut draft guidebook suitable for use by communities desirous of becoming "Smart" communities.

Task Area	Institution Lead
Community Networks	UC Davis
Smart Communities	SDSU / Center for the New West
Community Preparation	UC Davis
Government Services	UC Davis / Chula Vista
Educational Services	SDSU / UC Davis
Community and Social Services	SDSU
Work and Commerce	Center for the New West
Marketing (including Community Relations and Development)	SDSU / Chula Vista / UC Davis
Community Organization and Involvement	UC Davis / Chula Vista
Document assembly, validation, revision, completion and World Wide Web posting	SDSU / Center for the New West / UC Davis, Chula Vista

PRODUCT: Upon approval from Caltrans, written document and World Wide Web posting of first-cut draft guidebook. Reproducible briefing materials (text, overheads and handouts) for oral presentation and leave-behind events.

The Guidebook task group will represent 25 percent of the total project budget.

IV. DISSEMINATION OF RESULTS

This task group will document the lessons learned from the project and provide recommendations for further action. It will enable Caltrans to communicate the results to others in a document for publication and via the World Wide Web. It will also provide Caltrans with information on whether to supplement with a conference, video or CD-ROM to announce the results and explain the project to local officials and other parties interested in "Smart" communities for California. Submit press release to house organs of regional and statewide organizations serving cities, counties, and special districts, with goal of stimulating articles in their publications. The contractor will conduct the following activities:

A. Prepare final report.

1. Circulate draft document to appropriate reviewers for input and submit report to Caltrans for review and comment.
2. Make changes as necessary and create final report. Obtain Caltrans approval to issue final report document for public consumption.

B. Dissemination Methods

Recommend means and cost estimates of on-going information dissemination (to be funded later) including, but not limited to the following alternatives:

- Announce project results at conference(s). Determine whether the project can support a one-day issues conference and whether to participate (piggyback) in the conferences of key players, e.g. Chambers of Commerce, CSAC, League of Cities, special district associations, regional council meetings, etc.

- Prepare video or other non-interactive means of widespread documentation.
- Prepare CD-ROM or other interactive means of widespread documentation.

Determine best method and recommend to Caltrans. Identify steps to prepare for delivery, evaluation, and feedback; steps to implement; and method and schedule to document findings.

The Dissemination of Results task group will be initiated in the 49th week of the project and continue until the 52nd week of the project. The following specific assignments will culminate in the dissemination of project results.

Task Area	Institution Lead
Draft Final Report	SDSU / Center for the New West / UC Davis
Dissemination Methods	SDSU / Center for the New West
Final Document and World Wide Web posting	UC Davis

PRODUCT: Upon approval from Caltrans, written document and World Wide Web posting of final report and action strategy.

The Dissemination task will represent 10 percent of the total project budget.

V. PROJECT ADMINISTRATION AND COORDINATION

This task group will provide for project management and day-to-day administration as well as ensure that the project is fully coordinated with TDM projects and activities undertaken by other parties. The contractor will conduct the following activities:

A. Management and Administration tasks.

Manage and administer the work activities to ensure 1) full coordination of work tasks within project sponsors and participants and 2) acceptable, fully-functional subcontracting, and conduct project management functions, including:

1. Obtain staff and establish project team to include Caltrans, the University and other appropriate parties for review of approach and products.
2. Hold project team meetings as appropriate. To the maximum extent possible, electronic communication methods will be used for project management purposes.
3. Develop and manage subcontractor contract(s) pursuant to Caltrans approval.
4. Provide day-to-day project management and administration functions including invoices for payment, biweekly status reports, correspondence, etc.

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B. Coordination tasks

1. Provide information to Caltrans districts and other interested parties as project progresses, using audio and video conferencing whenever practical.
2. Establish communications and full coordination with related Caltrans TDM and telecommunications mobility projects including statewide strategic plan for TDM marketing (and regional partnerships for TDM marketing), TDM elements of regional overall work plans (OWPs) implemented through Metropolitan Planning Organizations, the statewide strategic plan for telecommunications mobility and subsequent projects, and all telecommunications mobility contracts being managed by the Caltrans Office of Transportation Demand Management or Caltrans district offices.
3. Hold a project-concluding briefing for Caltrans districts and selected headquarters program representatives (list to be supplied by Caltrans).

Task Area	Institution Lead
Principal Investigator / Project Administration	SDSU
Project management, coordination and reporting	SDSU / Center for the New West

PRODUCT: Fully managed, coordinated and documented project pursuant to contract documents, including administration of subcontractors, status report and invoice submittals, delivery of products and adherence to project schedule.

The Project Administration and Coordination task group will represent 5 percent of the total project budget.

**Appendix H: Status Tracking Report for Telecommuting
Centers in California**

**STATUS TRACKING REPORT
FOR TELECOMMUTING CENTERS IN CALIFORNIA**

Prepared for

The California State Department of Transportation (Caltrans)
and the Federal Highway Administration
under Interagency Agreement No. 60T381/A-3

by

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with Carol Buckinger
and Patricia Mokhtarian

Institute of Transportation Studies
University of California
Davis, California 95616

April 1995

This report outlines the status of known telecommuting centers in California. • A complete description of these sites was last issued in December 1994. For the benefit of readers and preparers of this document, we will report changes that have occurred at each site during the interim and avoid restating information from the previous report when possible.

The telecommuting centers contacted are administered by a variety of governmental agencies (normally a city government or regional Transportation Management Agency) and private concerns; they are situated in commercial, industrial, and residential areas; and they range in size from six workstations to more than 30 workstations. The common threads are the centers' current reliance upon government and corporate sponsors to supplement income generated by telecommuters, and a desire to generate the additional revenue that will allow them to become self-sufficient in the future.

Most view the key to self-sufficiency as a combination of increased awareness/acceptance of telecommuting as a concept and development of additional revenue-generating services. Efforts designed to increase awareness/acceptance of telecommuting include:

- Advertising using all forms of local media. Ads are targeted primarily at potential telecommuters: a popular approach is radio advertising scheduled to be broadcast during the heaviest morning and afternoon commute traffic.
- Erecting billboards along main commute arteries, and erecting posters in mass transit facilities.
- Networking through activities in local chambers of commerce, community groups, etc. to establish contact with potential telecommuters and their employers.
- Giving presentations to community or business groups.
- Identifying key people within companies who can help promote the concept of telecommuting to managers and potential telecommuters. In particular, some employers have transportation coordinators whose sole responsibility is ensuring that their companies comply with air quality regulations. These regulations normally include requirements to reduce the number of work trips made by employees.
- Bulk mailing letters or brochures to entire neighborhoods or to all employees of a specific company or government office.
- Distributing brochures or door hangers at public parking lots (especially at malls or park-and-ride lots) and at private residences.

Among the strategies for diversification being researched or implemented at these centers are:

- Providing videoconference facilities.
- Forming partnerships with community colleges or universities to provide distance learning facilities.
- Serving as training centers for various groups in their communities. Some examples include providing computer training to local residents, offering preparatory training for high school aptitude tests, and forming partnerships with

groups of parents to make their facilities available to middle school and high school students.

- Providing local residents and hotel patrons with drop-in use of office equipment, including computer hardware and software, CD ROM libraries, printers, copiers, and facsimile machines.
- Providing support for home-based telecommuters.

The 12 telecenters involved in the Residential Area Based Offices Program will first be discussed as a group. These centers are: Landmark Telebusiness Center in Anaheim; City of Chula Vista Downtown Telecenter; City of Chula Vista "H" Street Telecenter; Coronado Telecenter; Davis Telebusiness Center; Grass Valley Telework Center; East County, San Diego Telecommunity Center in La Mesa/El Cajon; Modesto Neighborhood Telework Center; Three Oaks Telecenter and Ulatris Telecenter in Vacaville; and the Moorpark Community College Telecenter and Ventura Community College Telecenter in Ventura County.

This will be followed by updates of 19 other telecenters currently operating in the state. Included in this group are: Antelope Valley Telebusiness Center Phase I; Antelope Valley Telebusiness Center Phase II; Antelope Valley Fair Telecommuting Center; Apple Valley Telebusiness Workcenter; Birch Lane Telecenter in Davis; Highland Telework Center; Long Beach Telebusiness Center; Los Banos Telecenter; Ontario Telebusiness Workcenter; Pomona Telebusiness Workcenter; The Telecommuting WorkCenter of Riverside County; San Juan Capistrano TeleBusiness Center; Santa Clarita Telebusiness Center; Santa Clarita Valley Telecommuting Center (U.S. GSA); Simi Valley Telework Center; Auburn Telecenter, Rocklin Telecenter, and Roseville Telecenter of the South Placer Transportation Management Association; and Valencia Corporate Telecommuting Center.

The final sections incorporate brief descriptions of the seven telecenters that are being planned and the three that have closed since December 1994.

TELECENTERS IN THE RESIDENTIAL AREA BASED OFFICES PROGRAM

INTRODUCTION

This section updates the progress of 12 telecommuting centers participating in the Residential Area Based Offices Program (RABO). This program is sponsored by the Federal Highway Administration and the State of California Department of Transportation (Caltrans), and is administered by the Institute of Transportation Studies at the University of California, Davis. Since the last report, four additional centers have opened: The City of Chula Vista Downtown Telecenter; the East County, San Diego Telecommunity Center, the Moorpark Community College Telecenter; and the Ventura Community College Telecenter. All twelve sites in the program have now officially opened for use, have signed agreements with telecommuters, and are reporting data to the project manager.

ANAHEIM

Landmark TeleBusiness Center

This center, which occupies approximately 6,700 square feet of the Kraemer Building in downtown Anaheim, offers a total of 15 workstations. Its funding sources remain the same as reported in December 1994, with support provided by the South Coast Air Quality Management District, the Anaheim Redevelopment Agency, Office Telephone Management, PictureTel, JPW Telecon, and Active Voice.

Recent marketing efforts have included advertisements in local newspapers, development of a new tri-fold brochure about telecommuting, and distribution of flyers in parking lots and at private residences. In addition, the site administrator is involved with various Chamber of Commerce activities and is cold calling corporations in the region to arrange presentations about the telecenter. She will also participate in a videoconference about telecommuting being conducted among the city of Anaheim, several businesses throughout California, UC-Davis and Washington DC on April 27 and 28. In addition to these activities, site developers have had some success in having companies mail information about the telecenter to their employees.

Five telecommuters from three different employers currently use the downtown Anaheim telecenter. In addition, two universities, the University of Phoenix and the University of California - Irvine, are considering use of the site for distance learning projects. Over the last several weeks, the center has been used an average of three person-days per week.

CHULA VISTA

Marketing for both Chula Vista sites is conducted concurrently and continues to be primarily directed at potential telecommuters through community outreach. Examples of planned or recently-completed activities include direct marketing to parents through local schools and day care facilities; contact with home owners associations, community clubs, and churches; and distribution of leaflets to local residents along with an invitation to an open house.

Efforts have also been made to approach employers directly. The Chula Vista administrators are working in a cooperative effort with the South Bay Coalition Group to target major businesses located in the Otay Mesa area for telecommuting, ride sharing and van pooling. They have already outlined a proposal to Sanyo North America on how these programs can be started, and will use this experience as a pilot program to prepare presentations for other companies in the area.

A great deal of additional no-cost publicity was generated for both of these telecenters with the grand opening of the "F" Street facility on February 25, 1995. The telecenters faxed approximately 50 press releases to TV stations, radio stations, and newspapers, and distributed over 300 marketing packages (brochures, flyers, fact sheets, and user agreements) at the grand opening. In addition, TeleImages, who donated the telecenter's videoconferencing system, and

the University of Phoenix, who rents a private office and classroom for evening classes, issued their own press releases about the event.

Site administrators followed this event with a public open house on March 9, 1995, which was also designed to maximize publicity for the centers at a very low cost. A flyer announcing the open house was designed and mailed to 970 county employees who live in Chula Vista. In conjunction with this mailing, an electronic mail message about the open house was sent to all county employees (over 16,000), and an article about the telecenter was included in the county newsletter. The same flyer was mailed to 517 city employees and 35 potential telecommuters identified by the marketing response report (a demographic report prepared for the university from a survey designed to solicit names of potential telecommuters living in neighborhoods surrounding RABO sites). The flyers were also distributed through the Chamber of Commerce, Visitors' Center, Chula Vista Library, Farmers' Market, and local businesses. Public service announcements were broadcast over radio, and announcements were posted in local newspapers and on local cable television stations.

Additional support for these centers is provided by the San Diego County Air Pollution Control District and Cox Cable.

City of Chula Vista East "H" Street Telecenter

The "H" Street facility recently added four more 486 personal computers, giving them a total of seven workstations equipped with PC's and one with a Macintosh. A second Macintosh computer has been donated by Cox Cable and should be installed soon. The final piece of new equipment acquired is a Xerox 5320ZTAS copier. A new software package called Desk Tracy will also soon be installed on all of the center's computers. It will track computer time and number of documents printed on the laser printer, bill for printed pages and fax/modem usage, and control access to each computer. It is intended to help create a secured computer environment for the telecenter and telecommuters.

Eleven telecommuters from nine different employers currently use the "H" Street Telecenter. Over the last several weeks, the center has been used an average of twelve person-days per week.

City of Chula Vista Downtown ("F" Street) Telecenter

As indicated above, this second Chula Vista telecenter opened in February. This site has a floor plan of 1,700 square feet that contains eight large cubical workstations, a private office, a large conference room with a videoconferencing system, a small conference room, a classroom, a kitchen area, and the Telecenter Technology Director's office. Office equipment includes five 486 DX 66MHz microcomputers with 15" CTX color monitors, fax/modems and software. There is also one Apple Macintosh 7100 AV/CD/16MB computer with a 17" display monitor, fax/modem and software, as well as an Apple Scan Maker II HR with OCR capabilities. Additional office equipment includes a laser printer, fax machine, Xerox copier, and phones with a digital message system. The Desk Tracy software described above will also be installed on the computers for this telecenter.

A new security system is currently being installed that will provide telecommuters with card access to the facility when they choose to work during non-business hours, and will provide security access control and tracking for the telecenter. A compatible security system from the same company is in place at the "H" Street Telecenter.

Four telecommuters from three different employers currently use the "F" Street Telecenter. Over the last several weeks, the center has been used an average of five person-days per week. In addition, the University of Phoenix rents a private office five days per week and a classroom four nights per week, and San Diego Legal Services rents one of the workstations five days per week.

CORONADO

Coronado Telecenter

There have been no changes to the facility since the last report. It is housed in a 725 square foot office and offers four cubicle workstations. As indicated in the December report, this center has no additional sources of funding.

New marketing ideas being tested by this center include production of a newsletter by the Coronado Transportation Management Agency (TMA). The newsletter will be used to spread information about all of the TMA's projects, including the telecenter. The TMA has also formed a partnership with Coronado High School students and the local cable television company to produce and broadcast four public service announcements about various TMA projects. The second of these four announcements will focus on the telecenter and is scheduled to be finished in April. If it is approved by the TMA, the announcement will probably begin airing on the local cable channel and other stations in June.

Eight telecommuters from five different employers currently use the Coronado Telecenter. Over the last several weeks, the center has been used an average of five person-days per week.

DAVIS

The two Davis sites, Birch Lane Telecenter and Davis Telebusiness Center, continue to be operated by the same private enterprise. However, since Birch Lane is not part of the RABO project, this and future reports will include it with the other non-RABO telecenters. Both of these sites continue to receive additional funding from the Yolo/Solano Air Quality Management District.

Davis Telebusiness Center

The name of the center has been changed from Davis Telework Center to Davis Telebusiness Center. The operator recently learned that trademark protection is claimed for the word "Telework." He decided to make a proactive name change and avoid any possible dispute.

The center has had no physical changes since the last report; it continues to offer a total of ten workstations in 932 square feet of space. Three of the workstations are located in a large room that also contains the reception area, two workstations are in each of two smaller offices, and a third office holds the final three workstations.

Equipment and service modifications are being explored to improve the services offered to telecommuters at this site. Administrators are currently considering options to provide voice mail and plan to implement the changes necessary to introduce this service by the end of April. Also, a current customer at the Davis Telebusiness Center has requested that Internet be made available at that site to improve communication and efficiency. As a result, administrators now plan to link the Davis telecenters together. They are also considering shifting the Internet connection from Birch Lane to the Davis Telebusiness Center using Frame Relay Technology.

To generate additional revenue, other services that complement telecommuting may be offered in the future. Available options include mobile offices, office hoteling, or renting space to visitors of other companies at Green Meadows Office Park.

Administrators plan to increase community awareness of the telecenter by distributing telework door hangers throughout East Davis. Door hangers were recently circulated to all 417 houses in the Mace Ranch development, generating two calls for potential telecommuters, with one likely prospect.

Four telecommuters from two different employers currently use the Davis Telebusiness Center. Over the last several weeks, the center has been used an average of three person-days per week. Agreements have recently been received from two additional telecommuters who will begin using the facility in April, one two days a week and the other five days a week.

GRASS VALLEY

Grass Valley Telework Center

There have been no physical changes to this center since the last report. It offers three cubicle workstations, one private secured office with a workstation, and one office with two workstations in a facility containing 1,494 square feet of space. The center continues to receive support from the Northern Sierra Air Quality Management District and Pacific Gas and Electric Company.

Marketing strategies continue to be primarily directed at recruiting employees through community outreach. Specific efforts in this area include direct mailings; radio promotion; and working with realtors, who use the telecenter as a selling point for potential home buyers. In addition, the site administrator contacts employers directly and works with key persons in each company to promote telecommuting and enable employees in the Grass Valley area to use the telecenter.

In the near future the center will significantly expand the technology and services it offers to users. After a great deal of research, a new AT&T Vistium desktop videoconference unit has been ordered and should be installed within the next few weeks. This equipment uses the

industry's standard language, making it compatible with videoconference equipment from the other major manufacturers. In addition, the site administrator plans to have Internet service available and to install a local area network at the facility during the next few months.

Six telecommuters from five different employers currently use the Grass Valley Telework Center. Over the last several weeks, the center has been used an average of eleven person-days per week.

LA MESA/EL CAJON

East County, San Diego Telecommunity Center

This center is now in operation, having celebrated its grand opening on March 15, 1995. The physical description has not changed since the December report: it offers six workstations in its 1,550 square feet. A private entrepreneur continues to manage this site, with funding assistance provided by the San Diego Association of Governments.

Marketing efforts for the telecenter focused on the grand opening and accompanying publicity campaign on March 15. Because some people may be intimidated by the idea of working in a technology center, the open house and publicity have been designed to market the facility as a knowledge center that promotes person-to-person communication and collaboration, with technology available as a tool for that purpose. To carry that idea into their daily workplace, the site's administrators are in the process of defining the type of customer service their users want and need. They expect this to be an evolutionary process as they become better acquainted with each telecommuter at their facility.

A marketing plan is now being designed that will contain a combination of broadcasting public service announcements on the local public television station, contacting local condominium associations to include articles/advertisements in their newsletters, contacting churches to list the telecenter's services in church bulletins, and contacting schools to include information about the center in packets sent home with schoolchildren. In addition, the site administrator is discussing possible joint marketing activities with administrators of the Chula Vista and Coronado telecenters.

Six telecommuters from one employer currently use the East County, San Diego Telecommunity Center. Over the last several weeks, the center has been used an average of three person-days per week.

MODESTO

Modesto Neighborhood Telework Center

There have been no changes in the site's physical description: a total of ten private workstations are available in its 2,600 square feet. Six additional personal computers have been ordered for

the center, which will bring the total number of PC's available to ten. Plans are also in place to purchase a copier.

The other agencies supporting this center have not changed since December; the San Joaquin Valley Unified Air Pollution Control District provides cash funding and Pacific Bell has provided office furniture.

Although severely limited by having no marketing budget, the site administrator has been very successful at publicizing the telecenter. Human interest stories about the center and its telecommuters were aired on the news broadcasts of all three Sacramento television stations during the quarter. In addition, the administrator addresses groups in the region who are interested in learning more about telecommuting.

Ten telecommuters from three different employers currently use the Modesto Neighborhood Telework Center. Over the last several weeks, the center has been used an average of seven person-days per week. The center does not charge fees to telecommuters, but they tentatively plan to begin charging in July 1995.

VACAVILLE

The City of Vacaville operates two neighborhood telework centers, one at each of the city's community centers. Both sites are easily accessible via exits from Interstate 80 or by bike lanes in the area, and are within easy walking distance of several residential developments.

In an effort to reduce dependence on grant funding and other outside support, currently received from the City of Vacaville and the Yolo-Solano Air Quality Management District, the City of Vacaville recently consolidated most administrative responsibilities for these sites from several individuals in the city's offices to a single Telecenter Coordinator. Efforts are now underway to determine a reasonable fee schedule and recruit additional telecommuters, with the ultimate goal to make each center self-sustaining.

Marketing is being coordinated for both sites in the same manner outlined in the December report. The emphasis has been placed on securing media exposure and identifying and working with key persons (normally transportation coordinators) at major employers. In addition to issuing press releases and advertising on cable television, the city has reached an agreement with a local radio station that allows the telecenters to receive three additional advertising spots for each one they purchase. This arrangement is due at least in part to the telecenters' relationship with the city, which provides them with nonprofit status. Other groups and organizations who will help publicize the facilities include realtors, the community welcome wagon, the local library, and the Chamber of Commerce.

Three Oaks (Alamo) TeleCenter

Vacaville's City Council recently met and renamed the Alamo Community Center and attendant facilities "Three Oaks". Over the course of the next few months, both names will be used interchangeably for those facilities. This summer the city plans to develop a park adjacent to the site.

The addition of a Macintosh computer and software was the only significant physical change at the site since the last report.

Twenty-three telecommuters from seven different employers currently use the Alamo TeleCenter. Over the last several weeks, the center has been used an average of eight person-days per week.

Ulatis TeleCenter

The Ulatis TeleCenter is located within the city's newest community center, along with the community theater and the county library. The center offers a total of seven cubicle workstations and occupies 540 square feet. As with the Three Oaks TeleCenter, the facility's only significant physical change since the last report is the addition of a Macintosh computer and software.

Twenty-one telecommuters from nine different employers currently use the Ulatis TeleCenter. Over the last several weeks, the center has been used an average of seven person-days per week.

VENTURA COUNTY

Telecenters have now opened on the Ventura Community College and Moorpark Community College campuses. The marketing plan for the Ventura County telecenters has been expanded from that listed in the December report to contain the following activities.

- Presentations to the Ventura County Government and Ventura City Council to become "Corporate partners."
- Presentations to the County-wide Employee Transportation Planners, local Internet sites, the Northridge Chamber of Commerce, and a local business fair.
- Mailings to a list of local businesses in Ventura County as well as targeted large-scale employers in Los Angeles County.
- An Open House for each site (one in January 1995, one in April 1995) with presentations about the positive benefits of a telecommuting program, the services provided at each campus, and strategies for managing telecommuters.
- Agreements and Memoranda of Understanding (MOU) have been developed and incorporated into a packet of materials being mailed to interested parties.
- Marketing to the federal government, particularly through CASU, which fosters interagency cooperation and innovation to create a "family-friendly workplace."
- Distribution of brochures to faculty on each campus and at the District Office.
- Flyers will be posted on bulletin boards on each campus to recruit students.

- A survey was conducted to identify students who are employed full or part time, and brochures have been mailed to them.
- Advertisements have appeared in the *Los Angeles Times*, campus newspapers, and on radio.
- Public service spots are being prepared.

Articles about the centers have appeared in the *Los Angeles Times* and the *Ventura County Star Free Press*.

As in December, these centers have no additional funding sources.

Moorpark Community College Telecenter

The Moorpark Telecenter opened for use in April 1995. It occupies approximately 900 square feet, and includes five cubicle workstations and a conference room. Office equipment includes two 486 personal computers with fax/modems and software, as well as one Macintosh 7100 Power PC. There is also one shared laser printer, one external facsimile machine, and a phone system that allows the addition of voice mail service as needed. The college campus provides convenient food service facilities, bookstore, library resources, postal and Federal Express services, and UPS service upon request.

The center will be equipped with videoconferencing equipment in the near future. Developers are currently attempting to forge a corporate partnership that would result in shared or donated videoconferencing equipment. They are also preparing to solicit bids for the equipment in case an agreement cannot be reached for a corporate partnership.

The first telecommuter recently began using the Moorpark Community College Telecenter.

Ventura Community College Telecenter

Ventura College has leased a modular building for this site. There are four cubicle workstations and one private office with personal computers (four 486 PCs and one Macintosh 7100 Power PC, all with fax/modems) and phone lines that allow for voice mail service as needed. A conference room, facsimile and copy machines are also available. Future plans include videoconferencing and distance learning services. The college campus provides convenient food service facilities, bookstore, library resources, postal and Federal Express services, and UPS service upon request.

Two telecommuters from two employers currently use the Ventura Community College Telecenter. Over the last several weeks, the center has been used an average of three person-days per week.

CURRENTLY OPERATING NON-RABO CENTERS

INTRODUCTION

In addition to the 12 centers involved with the RABO project, we have identified 19 telecenters in California that are currently operating. This latter group includes two telecenters, Long Beach Telebusiness Center and San Juan Capistrano TeleBusiness Center, that have opened since the December 1994 report, plus one, the Valencia Corporate Telecommuting Center, which opened in 1993 but has not previously been included in this report series. A brief description about each of these telecenters follows.

Antelope Valley Telebusiness Center Phase I and Antelope Valley Telebusiness Center Phase II

The relationship between these centers remains the same as outlined in the last report, with both centers managed by the same project manager at the County of Los Angeles. The sites' physical descriptions are also unchanged. The first center offers a total of 20 workstations, while the second center has a total of 39 workstations.

Marketing and recruitment efforts are currently concentrated in telemarketing and building relationships within the region's business community. The sites report that 79% of their space is leased, with approximately 70% of the workstations used each day. Each site currently charges \$380 per month for a cubicle and \$420 per month for an office. These rates are flat fees that include the use of all office equipment.

The learning service outlined in the December report has proven successful. There are currently four classes being offered at the center through California State University - Northridge, with a total of 29 students attending the classes. The site is collecting data to determine the mileage saved by holding the classes at the telecenter rather than on the Northridge campus.

Other services that continue to be offered include the loan of laptop computers and rental of videoconferencing facilities. Six laptop computers are currently being used. Several of them are stationed at area businesses and the local Transportation Management Organization to make them as convenient for users as possible. Unlike some of the other telecenters, the site administrator has not seen an increase in demand for videoconferencing service in her area.

Antelope Valley Fair Telecommuting Center (at the Antelope Valley Fairgrounds)

The physical description of this site remains unchanged, with 20 open-area workstations and four private offices available in an 8,000 square foot facility. All grants for this center have expired, with the exception of Caltrans funding. Rent for use of the site is currently set at \$200 per month for an office and \$150 per month for an open workstation.

The site's marketing activities include distributing pamphlets and brochures; giving presentations to various community and business groups; and meeting regularly with the Southern California Telecommuting Partnership, which is a networking group consisting of administrators, employers, and telecommuters that discusses telecommuting issues and shares ideas.

Six telecommuters from three companies currently use the facility, with one or two telecommuters in the center each day.

Apple Valley Telebusiness Workcenter

This site's physical description remains unchanged, with a total of 12 workstations available. In addition, the center continues to be funded by the San Bernardino Associated Governments and the Mojave Desert Air Quality Management District, as previously reported. Rent at the facility is currently \$247 for a workstation with a telephone, voice mail, and use of other office equipment. Additional fees are charged for facsimile transmissions, photocopies, and telephone toll charges.

A marketing plan is being developed and will be implemented by the High Desert Regional Economic Development Authority, which received a \$30,000 grant for that purpose.

Eleven telecommuters from five different employers currently use the facility. An average of three telecommuters are in the center each day.

Birch Lane Telecenter in Davis

Marketing efforts, funding sources, and the site description all remain unchanged since December. The center is located in the computer lab of Birch Lane Elementary School and is used as a teaching facility during school hours. It offers 16 80486 personal computers with CD ROM, multi-media capabilities, and fax/modems; approximately 300 different software packages; color ink jet laser printer; a CD ROM library with over 500 disks; and a color scanner.

Because this site is available to outside users only after school hours, it currently has no telecommuters. The center is utilized predominantly by drop-in computer users. An average of 15 to 20 drop-in users visit the center each day.

Availability of Internet has led to a substantial increase in traffic during the last quarter. Specifically, the number of intercity telecommuters to the University of California-Davis campus via Internet has increased. In addition, several Internet classes have been provided at the center for a non-profit agency.

Highland Telework Center

The physical description remains unchanged from the December report; the center offers a total of six workstations. Funding is currently received from Caltrans and AB2766 subvention funds. Funding from the South Coast Air Quality Management District expired on March 15, 1995. Corporate contributions have been received from Intel, PictureTel, Pacific Bell, Hewlett Packard, East Highlands Ranch, Inc., The Hon Company, Patton Sales Corporation, and I P S Instant Print Shops. Fees at the center currently include rent of \$100 per month for each workstation an employer reserves (several employees can then use that station during the month at no additional charge) and \$15 per day for drop-in computer users. The administrator plans to propose to the Highland City Council that the monthly fee be increased to \$125 per month per workstation for the first telecommuter, with additional fees for each additional person using a workstation.

Current marketing activities include cold calling regional companies, distribution of a new brochure to local residents, and advertisements on the local cable television station (potential telecommuters have responded to these ads; the tape for the spots is being updated). Also, an article about the center recently appeared in a new community newspaper. The survey mentioned in the December 1994 report met with mixed results: of 1,107 surveys sent out, only 17 were returned; however, some people who didn't return their surveys later came in to see the facility and became telecommuters. The administrator reported that demand for the center's videoconference equipment is increasing. He also indicated that he perceives an increase in public awareness about the center and the services it offers.

The center currently has seven telecommuters from five different employers. An average of four telecommuters use the facility each day.

Long Beach Telebusiness Center

This center held a grand opening celebration on March 15, 1995. The final version of the lease agreement has now been approved, and copies have been mailed to potential telecommuters. At least five people have indicated very strong interest in using the facility.

The physical site description remains unchanged from the December 1994 report, with ten private offices arranged around 27 open-area workstations. Office Technology Group, a commercial property management company, has been hired to manage the center, including the development and implementation of a marketing plan. The company will provide an on-site Administrative Manager to handle daily operations, conduct tours for potential telecommuters and their employers, etc. In addition, one of the marketing professionals on staff at Office Technology Group will devote part of each day to the telecenter.

Past marketing activity has included advertising on the local public access cable television station, a media release printed in the local newspaper, membership in telecommuting organizations, establishment of a City of Long Beach "home page" on the Internet, and maximizing publicity for the grand opening.

The center will charge \$400 per month for an interior workstation and \$500-700 for one of the private, exterior offices. With a signed 12-month lease agreement at those rates, the center commits to providing up to \$3,000 worth of hardware for each workstation/office.

Los Banos Telecenter

Did not respond.

Ontario Telebusiness Workcenter

This site contains a total of 18 workstations. The sole change in the physical description of the site and in funding sources since the last report is a corporate donation: Xerox provided upgraded photocopy and fax machines at the center in February 1995.

Most of the site's marketing efforts are still coordinated with the Inland Empire Telecommuting Partnership, which includes Apple Valley Telebusiness Workcenter, Highland Telework Center, Ontario Telebusiness Workcenter, Telecommuting WorkCenter of Riverside County, and Pomona Telebusiness Workcenter. The group pools most of its marketing resources and promotes all of the centers. For instance, PacTel provided posters promoting all of the sites and installed them in bus shelters in Pomona, Ontario, Apple Valley, and Riverside. Also, a new toll-free telephone number for all members of the group has been installed and is paid for by Caltrans.

The site currently has a total of 33 telecommuters and averages 25% - 35% occupancy each day.

Pomona Telebusiness Workcenter

The site description, funding sources, and fee schedules all remain unchanged since December 1994. The center contains three open-area workstations and eight private offices, and covers 3,200 square feet. The primary funding source continues to be the Los Angeles County Metropolitan Transportation Authority (LACMTA).

Marketing activities, which are primarily coordinated through the Inland Empire Telecommuting Partnership, include distributing flyers at transit stores and day care centers, as well as advertising in the local newspaper and on cable television. Site developers plan to start a program involving marketing to businesses in the near future.

This center currently has eleven telecommuters from seven different employers. An average of two to three people per day use the facility.

The Telecommuting Workcenter of Riverside County

As reported in December 1994, funding sources for this center are the Riverside County Transportation Commission and the Petroleum Violation Escrow Account. Marketing efforts are still coordinated with the other members of the Inland Empire Telecommuting Partnership.

The Workcenter moved in 1994 to a facility located near State Route 91 at the Arlington offramp; the site administrator reports that funding for the move was provided by the Riverside County Transportation Commission. The workcenter consists of seven offices, one of which has four workstations while the others have two or three workstations each. Rent for each of the seven offices is \$100 per month. As indicated previously, the facility has an open space that is available for expansion when needed. At the present time, six of the offices are rented to five employers. A total of 28 telecommuters use the facility, with an average of approximately five per day.

San Juan Capistrano TeleBusiness Center

The San Juan Capistrano TeleBusiness Center opened March 11, 1995. The center has approximately 1,900 square feet of recently refurbished office space. It consists of seven private offices with a single workstation in each (some with Intel videoconferencing equipment); seven cubicle workstations, one private conference room available for audio or videoconferencing (PictureTel equipment); a separate classroom with video capability; a break area with sink, microwave, coffee pot, etc.; and a reception area with an on-site administrator. Equipment includes PCs and Macintosh computers, scanners, laser and ink jet printers, and photocopy and fax machines. ISDN lines and modem access to the Internet are also available.

The TeleBusiness Center is located just off Interstate 5 and the Ortega Highway, in the Ortega Business Center. The downtown Amtrak/Metrolink station is within walking distance of the center; an Orange County Transit Authority (OCTA) bus stop serving multiple routes within the county and to Los Angeles and San Diego is directly across the street; and a city bike path passes behind the business park. The Ortega Business Center offers a diversity of services, including a federal express pickup office, restaurants and fast food, a convenience store, day care, fitness center, laundry and dry cleaning, computer sales and service, professional offices (legal, medical, dental, insurance, and real estate), bakery, florist, boutiques, and bike racks. It is also adjacent to Saint Margaret's School (grades K through 12).

This site is being managed by an entrepreneur. Funding comes from a grant issued by the OCTA; private sources, including in-kind equipment and services; and an equity investment by the operator.

Marketing is being planned for both telecommuters and employers. Marketing to telecommuters will include advertising in local newspapers, free press, and regional editions of major newspapers; networking through the local chambers of commerce and service groups; and presentations to private residential communities. Marketing activities planned specifically for

employers are: contacting companies listed by the Air Quality Management District; addressing employers' associations; issuing press releases to local business publications; and networking through employers' chambers of commerce.

Santa Clarita Telebusiness Center

Located in the Valencia Industrial Center, this center contains 15 open-area workstations and five private offices. The only physical change to the site is the addition of electronic equipment including a satellite dish on the roof. Equipment is being installed that will allow the center to establish a Wide Area Network (WAN) that will connect it with schools, city offices, the hospital, newspapers, and other groups. It is designed to complement the videoconferencing capabilities and other services already offered at the site. The WAN is expected to be operational in May 1995.

Marketing efforts have included newspaper advertisements headlined with, "How can you be more productive? Don't go to work." The ads have had some success generating inquiries and increasing awareness. The center's plan, outlined in the December 1994 report, to contact employers listed with the South Coast Air Quality Management District has been completed. A brochure and folder describing the Santa Clarita Telebusiness Center were mailed to all companies in Los Angeles County with employees living in the telecenter's zip code. The director of the center characterized the results as moderately successful.

Among the corporate sponsors who have donated equipment or software to the center are Intel, PictureTel, Microsoft, Lockheed, and Edison. The center is currently in the second year of a grant from the Los Angeles County Metropolitan Transportation Authority. Administrators hope to be self-sufficient after this year. Although the charges remain \$400 per month for a private office and \$175 per month for a workstation, the center no longer routinely waives rent for the first three months.

The center currently leases space to 18 different employers. An average of 20 - 22 people use the center each day.

Santa Clarita Valley Telecommuting Center (U.S. GSA)

This center is administered by the United States General Services Administration (GSA); it was opened in February 1994 in response to the Northridge earthquake of January that year. The facility covers approximately 5,000 square feet and contains 32 workstations. Some of the workstations are in a central, open workplace, and the balance are in offices (two or three workstations per office) arranged around the perimeter. The telecenter makes available 486 PC's equipped with fax/modems, DOS, Windows, and Microsoft Office, as well as two HP Laserjet printers, fax and copy machines, desk supplies at each workstation, telephones, three conference rooms, a kitchenette with refrigerator and microwave, and offstreet parking.

Last year GSA paid to establish the telecenter and paid all expenses for its operation without charging rent to the agencies using the facility. GSA notified agencies using the facility that they would begin charging a fee on January 31, 1995, to recover rental costs incurred for leasing the site. Immediately before this announcement, 28 telecommuters regularly used the center; only 14 telecommuters currently use the facility each day. The fees have, in fact, been delayed until May 1, 1995, when GSA will begin charging expenses (\$235 per month per station) back to the telecommuters' agencies.

The center is currently available only to federal agencies, however, GSA is exploring the possibility of extending the use to local and state agencies.

Simi Valley Telework Center

The physical description of this site has not changed since December 1994. The telecenter has four workstations, a copier and fax machines, and can provide dedicated phone lines. Videoconference equipment from Intel and PictureTel is in place. Support for the telecenter comes from the Transportation Management Association, which provides use of its facility, and a \$200,000 grant from the Petroleum Violation Escrow Account. A portion of the grant will be used to purchase computer equipment. However, the administrator does not plan to make that purchase until signed agreements from telecommuters are obtained.

Current marketing efforts involve communication with the Southern California Telecommuting Partnership. That group has federal funding to promote telecommuting in general, and the administrator hopes to gain some benefit for his telecenter from their project.

The lease rate for a workstation is listed as \$300 per month, but that amount is negotiable, depending upon the amount of use and user requirements. There are currently no telecommuters using this facility.

South Placer Transportation Management Association (SPTMA)

The SPTMA currently manages three telecenters in the northeastern Sacramento Metropolitan Area. Fees at the three remaining telecenters are still \$20 per day, but that amount may be negotiable for companies that have several employees at the sites and that use the sites often. No information was available regarding other funding. Marketing activities were described as meeting with and mailing information to major employers in the region, and contacting the residents of South Placer County.

Auburn Telecenter

The site description remains the same as in the report dated December 1994. A total of 12 workstations are available.

Rocklin Telecenter

This telecenter now has eight workstations instead of twelve.

Roseville Telecenter

The site description remains the same as in the report dated December 1994. A total of 16 workstations are available.

Valencia Corporate Telecommuting Center

This telecenter was opened in September 1993 and is operated by The Newhall Land and Farming Company. It is a 30,000 square foot facility adjacent to Interstate 5, one-half block north of the Magic Mountain Parkway exit. The center is located in a refurbished building in the 9,000,000 square foot Valencia Industrial Center. Services in the Industrial Center or in the immediate vicinity include restaurants, a Federal Express office, and day care facilities. Tenants at this center rent unfurnished carpeted space by the square foot, then install cubicles or private offices to fit their needs. Rental rates are dependent upon length of lease: \$1.25 per month per square foot with a lease of 12 months or more; \$1.50 per month per square foot with a lease of six to 12 months; and \$1.75 per month per square foot with a month-to-month lease. The center also provides cabling for voice and data networking services, use of conference rooms, and, on request, voice mail, ISDN, videoconferencing, and furniture workstations.

Marketing is directed to major corporations that have been identified in the region. Activities include direct mailings, telephone contacts, and facility tours for corporate representatives (normally human resources representatives or transportation planners) who are responsible for telecommuting employees. Steve Valenziano of CB/Langdon Rieder Corporation is providing corporate tenant support and marketing.

In addition to The Newhall Land and Farming Company and CB/Langdon Rieder Corporation, sponsors of the center include Pacific Bell, which provides communications equipment and wiring, and COMSUL Ltd., which provides technology management and communications consulting.

Although this center had as many as 30 telecommuters from six employers after the Northridge earthquake, the number dropped substantially approximately two months ago, when one-year leases expired. The site administrator indicated that telecommuters were enthusiastic about their working environment. However, employers were reluctant to continue with the arrangement.

The center currently leases space to one employer who has a total of five employees using the facility. An average of two of those employees work at the center each day. Santa Clarita Telebusiness Center leases its space from the Valencia Corporate Telecommuting Center and is located in this facility. This relationship has helped generate some joint press coverage, but in general the two centers have chosen to direct their marketing efforts toward different audiences.

PLANNED NON-RABO TELECENTERS

INTRODUCTION

Seven telecenters are in various stages of the planning process, including four not previously included in these reports: City of Encinitas Telecenter, Interactive Intelligence Centers in Irvine, San Luis Obispo Telecenter, and Santa Cruz Telecenter. Brief descriptions of each follow.

Encinitas Telecenter

A feasibility study has been completed and a preliminary report written. Although the final report is not yet prepared, the preliminary report indicates that there is a significant base of long-distance commuters who are employed in positions that would support telecommuting and a sufficient amount of regional employer interest to justify a small center. Presentation of the findings were made to the City Council on April 19, 1995.

Interactive Intelligence Centers - Irvine

This center is being managed by a private company, and is funded by a partnership of Irvine Valley College, the City of Irvine, Pacific Bell, the Hyatt Hotel, and the operator. After a three-year research and planning period, this center is tentatively scheduled to open in May 1995. Specific site information such as the number of workstations, computers, etc. has not yet been finalized.

The center is planned to include approximately 14,000 square feet of space in Jamboree Center, which is located just off Interstate 405 at the corner of Main Street and Jamboree Road. The site is situated between a large residential neighborhood and an established commercial area. OCTA and the City of Irvine provide public transportation to Jamboree Center. A telecenter shuttle will travel throughout the residential area and downtown, and the Hyatt Hotel airport shuttle service will also stop at the site. Bike racks will be available at the center for those telecommuters who choose to travel via the bicycle paths available in the area.

The telecenter will provide day care services at the site. In addition, a full service cafe is located in the same building, and within walking distance are a strip mall and three plazas offering several other options for restaurants or fast food, a convenience store, dry cleaning service, etc. The Irvine Hyatt Hotel is also located within one block of the center.

***Los Angeles County Metropolitan Transportation Authority
Blue Line TeleVillage Demonstration Project***

At the time of the previous report, no likely location for the center had been identified; and there was some uncertainty over whether the telework center should be housed at the same site as the rest of the TeleVillage project. Tentative plans now call for all services in the TeleVillage project, including the telework center, to share the same facility. The Compton Transit Center building, located across the street from the Compton Metro Blue Line Station, has been selected as the preferred location for the TeleVillage. The L. A. County Metropolitan Transportation Authority is beginning procurement of an operator for the TeleVillage and equipment for the computing center.

A workshop was held at the Compton Transit Center on February 17, 1995, to introduce the TeleVillage concept to the community and to allow organizers to get feedback on the project from community-based organizations. An advisory board composed of members from community organizations is currently being formed.

Plans are being completed to provide a computer training program and open the telework center in the summer of 1995, and to start a distance learning project this fall. The updated timetable calls for a grand opening late in September 1995.

The project is currently scheduled to last twelve months, however, a search has already begun to obtain additional funding that would allow the project to be extended and expanded. One possible source for funding is the Telecommunications and Information Infrastructure Assistance Program (TIIAP), administered by the Commerce Department's Telecommunications and Information Administration. Last year the program distributed \$25 million to develop various aspects of the information superhighway, and the amount to be disbursed this year is estimated at \$64 million. The MTA has submitted an application for additional funding from this program.

Palos Verdes Peninsula Telecenter

Previously known as the Rancho Palos Verdes Telework Center, this center was transferred to the management of the South Bay Transportation Corridor Steering Committee in the summer of 1994. The City of Redondo Beach is serving as Project Coordinator for the group.

An MOU has been signed with the Los Angeles County Metropolitan Transportation Authority to fund a feasibility study for the center with results expected in the summer of 1995. All decisions about a possible telecenter will be delayed until that time.

San Luis Obispo Telecenter

The San Luis Obispo Council of Governments and Caltrans are currently conducting the feasibility study for a proposed telecenter. A final report on the study is expected by September 30. Planners are very optimistic, citing enthusiasm for the project from local public officials and businesses.

Santa Cruz Telecenter

A feasibility study has been completed that showed there is a large potential demand for a telecenter in the Santa Cruz area; over 20,000 people commute out of Santa Cruz every day. Plans are still in a preliminary stage, however, a center of eight to fifteen stations is anticipated.

Torrance Telecommuting Center

The City of Torrance is still in the planning phase of establishing a telecommuting project. The city is currently searching for additional funding to supplement the \$150,000 grant previously reported.

CLOSED TELECENTERS

INTRODUCTION

The three following Telecenters have ceased operation since the December 1994 report was issued.

Citrus Heights-South Placer Transportation Management Association

The Citrus Heights Telecenter was closed in January 1995. The SPTMA office indicated the center had been closed because it was located outside Placer County.

Sherman Oaks and Van Nuys Telecommuting Center* *Thousand Oaks and Westlake Telecommuting Center

These centers both closed in January 1995.

The federal government began its telecommuting program in the Washington DC area and intended to study the East coast program before expanding it across the country. As a result, no preliminary site selection studies or surveys had been conducted when the Northridge earthquake hit. Although the possibility of opening as many as nine telecenters throughout

California for federal employees was discussed, a decision was made to immediately open three centers in Southern California to help residents cope with the damage resulting from the earthquake.

Very limited information was available regarding the number of federal employees living near the three sites selected, how many of those employees would be interested in using the facilities, which of the federal agencies and managers in those areas would be willing to allow their employees to use the sites, etc. As the program continued, it became clear that the Santa Clarita facility received much more interest from users than either the Sherman Oaks and Van Nuys location or the Thousand Oaks and Westlake location. The lack of detailed information in site selection seems to have been a significant factor in the eventual closure of these two centers.

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